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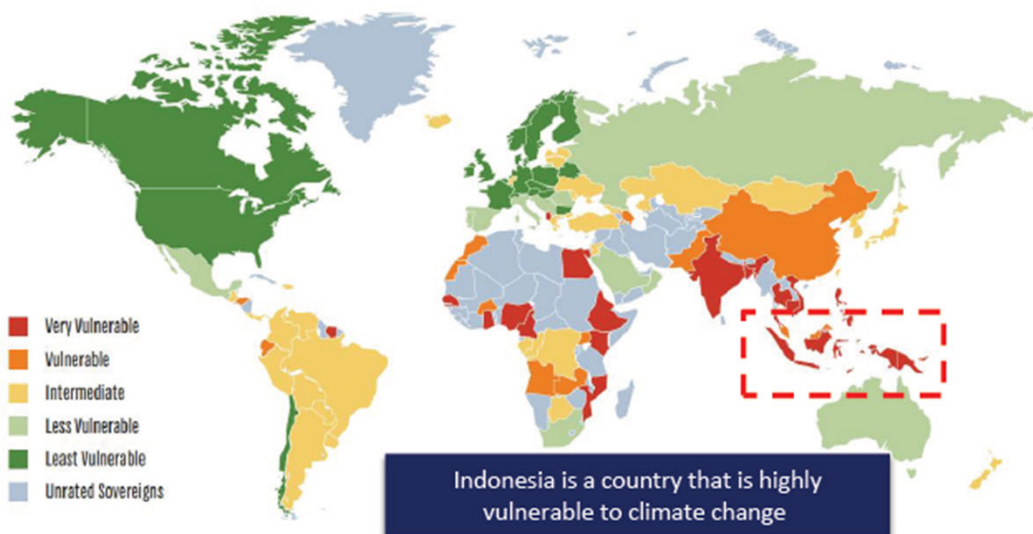


# **Enhancing Indonesian Early Warning System**

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Baku, November 2024

# INDONESIA and CLIMATE CHANGE



Indonesia is an archipelagic state with more than >17.000 islands, thus highly vulnerable to the impact of climate change, including extreme weather, and sea level rise

An increasing trend of National GHG emission

From 1981-2018, Indonesia experience an increasing temperature of 0,03 / year

Source: BMKG (2020)

Sea level rose between 0,8-1,2 cm/year, while 65% of community living in the low laying, small island and coastal area

## The impact of climate change



### WATER SCARCITY

An increasing intensity of floods and drought impacted to availability of water



### REDUCE HEALTH QUALITY

Changing in temperature have an impact to vector-born disease (e.g. dengue, malaria, diarrheal) and increasing stress and mental health



### DESTRUCTION TO LAND ECOSYSTEM

An increasing frequency and severity of wildfires that impacted to ecosystem and biodiversity loss and change in forest biomass



### FOOD SECURITY

Extreme weather (e.g. drought and flood) impacted the availability of food.



### DESCRUPTION TO MARINE ECOSYSTEM

An increasing sea temperature, ocean acidifications has an impact to coral reefs (e.g. coral bleaching), seagrass, mangrove ecosystem, and other marine biodiversity



### ENERGY STABILITY

Climate Change damage energy infrastructure and unbalance of energy demand

Climate change potentially increase the risk of Hydrometeorological disaster, that currently over

**80%**

Of all disaster in Indonesia

Source : Adcom 2022

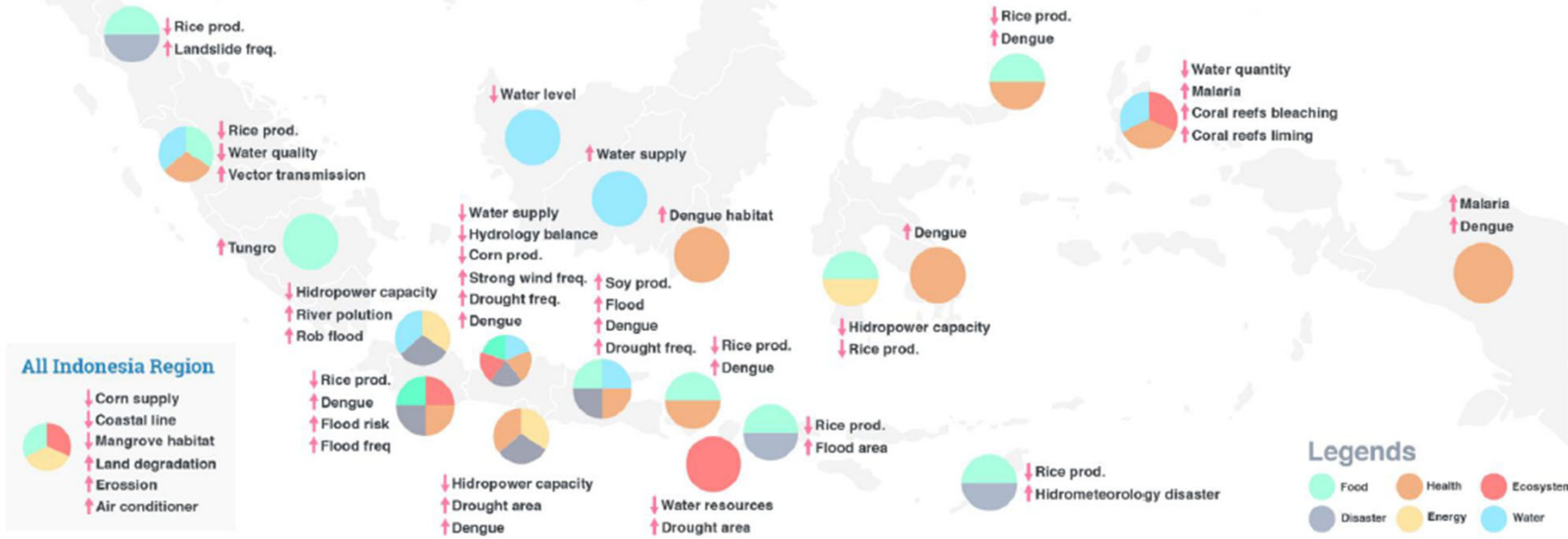
Economic losses potentially achieve ,

**0.66%-3.45% PDB**

At 2030

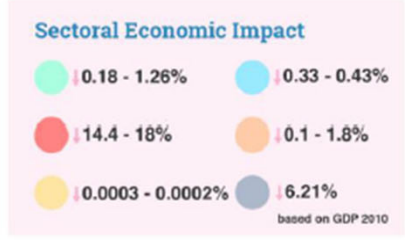
Source: Adcom 2022

# IMPACT AND RISK



### All Indonesia Region

- ↓ Corn supply
- ↓ Coastal line
- ↓ Mangrove habitat
- ↑ Land degradation
- ↑ Erosion
- ↑ Air conditioner



### Disaster

Indonesia Ranked Third in High Climate Risk

#### Distribution of Total Hydrometeorology Disaster Events in Indonesian

- Flood 32%
- Landslide 21%
- Wind Storm 30%
- Forest Fire 10%
- Drought 5%

Extreme Events: Seroja Cyclone & Rancakèk Tomado

Impact on Nasional GDP (-6) - (-30%)

### Ecosystem

- 40% Mangrove Loss
- 19% Mangrove in Critical Condition

Impact on GDP (-5) - (-26%)

- 18% Coral Reefs
- 0,079% Seagrass Field
- 14% Land Biome

Ecosystem Services

## Indonesia Climate Risk

GCRI 14<sup>th</sup> of 180

#### Climate

- Tavg > 35°C freq. increased
- Tavg +2°C by 2100
- Annual Rainfall +20% by 2100
- SLR 0.18 - 0.23 m by 2050
- Increasing intensity of extreme weather events

#### Climate Risk Indicators

Agricultural Drought % of time	Hydrological Drought % of time	Heatwave Duration % of time	Runoff Increase % of area
+13%	+13%	+33%	+35%
+17%	+8%	+11%	+11%
+8%	+8%	+32%	+8%

Agricultural Drought Freq. % of change	Hydrological Drought Freq. % of change	Heatwave Frequency % of time	Runoff Decrease % of area
+22%	+2%	+3%	+23%
+17%	+4%	+3%	+19%
+4%	+4%	+34%	+8%

#### IPCC AR 6 Indonesia Key Risk

- Flood
- Sea Level Rise
- Urban Heat Island
- Extreme Rain
- Drought

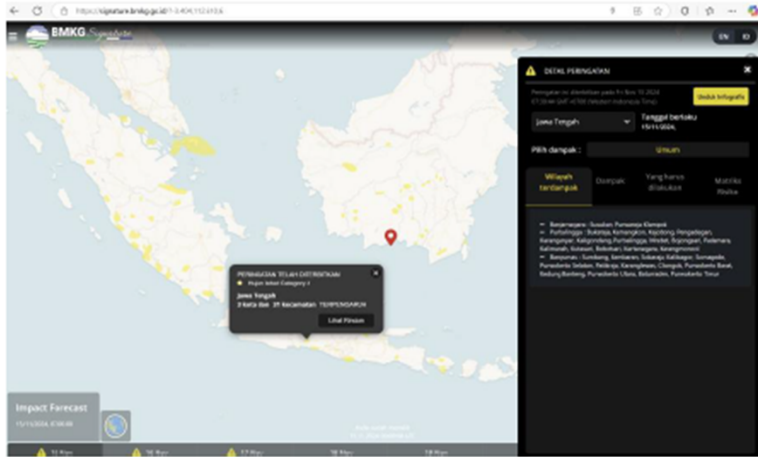
#### Southeast Asia Risks

- Ecosystems: habitat loss
- Water: scarcity and drought
- Health: water and vector-borne disease increase
- Food: undernourishment increase
- Energy: increased energy demand
- Cryosphere: glacier melts
- Cities: infrastructure damage
- Migration: increase migration flows

Risk level: Large (big circle), moderate (medium circle), small (small circle) | Risk evidence: high (red), medium (orange), low (blue)

(AdComm – MoEF – 2022)

# EARLY WARNING SYSTEM



## Meteorology Early Warning System

(MEWS; <https://signature.bmkg.go.id/>)

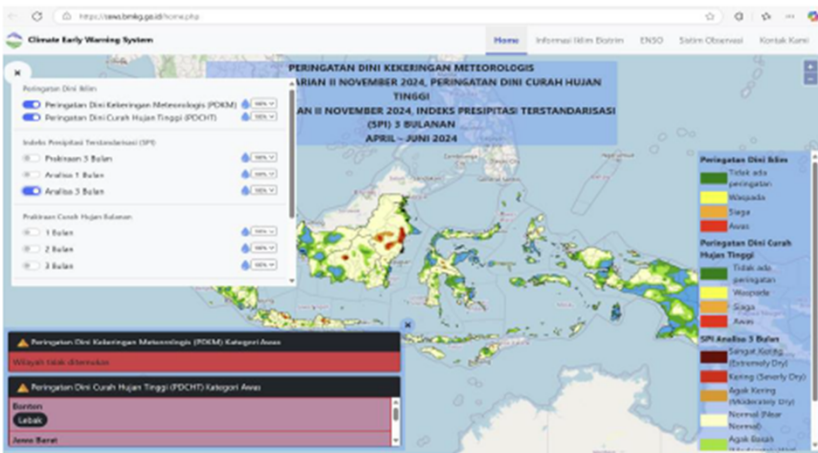
Dev' by : National Climatology and Meteorological Agency (BMKG)

BMKG Signature : *System for Multigeneration Weather model analysis and Impact forecast*

## Climate Early Warning System

(CEWS; <https://cews.bmkg.go.id/home.php>).

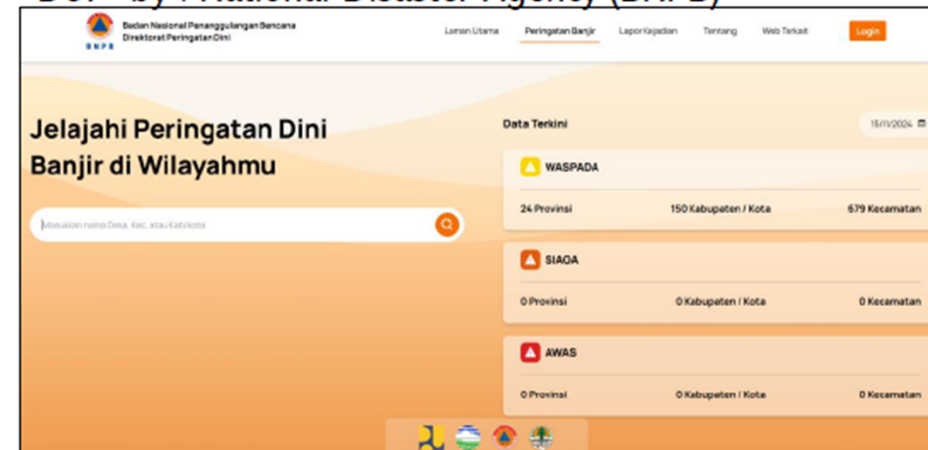
Dev' by : National Climatology and Meteorological Agency



## Floods Early Warning System

<https://dashboardpencegahan.bnpb.go.id/>

Dev' by : National Disaster Agency (BNPB)





United Nations  
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# TERIMA KASIH

*It is time to act.....*

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