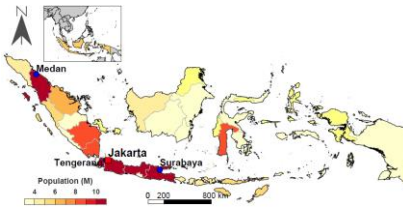
NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

INDONESIA
County Risk Profile

ADRFI-2
An ASEAN Initiative

Social Indicators (2019)

Population (million)[1]:	270.6
Population density (km^{-2})[2]:	149.4
Population growth rate (% yr^{-1})[3]:	1.31
Urban population growth rate (% yr^{-1})[4]:	2.82
Urban area growth rate (% yr^{-1})[5]:	3.7
Human Development Index[6]:	0.707
HDI Rank[6]:	111/189
Largest cities by population[7]:	Jakarta, Surabaya, Tangerang, Medan



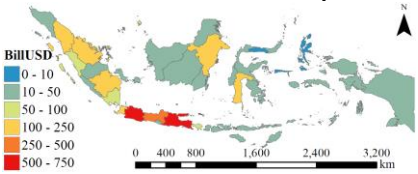
Geography

Land area (km^2)[8]:	1,904,569
Land area below 5 m MSL (%)[8]:	2.8
Length of coastline (km)[9]:	54,716 km
Terrain[9]:	Mostly coastal lowlands; larger islands have interior mountains
Major river systems[10]:	Kapuas and Mahakam Rivers in Kalimantan; Sepik and Fly in Papua

Economic Indicators (2019)

GDP (million USD)[8]:	1,042,173
GDP PPP (million USD)[8]:	3,500,936
GDP per capita, PPP (USD)[8]:	13,079.6
Agriculture (%)	13
Industry (%)	40
Services (%)	43
Others (%)	4
Exposure (Billion USD)[11]:	3,831
Primary (%)	8
Public (%)	5
Industry (%)	21
Commercial (%)	27
Residential (%)	39
Gross capital stock (Billion USD)[12]:	4,889
Insurance density (USD)[13]: (Non-life premium in USD per capita)	15.42
Insurance penetration (%)[13]: (Non-life premium in USD as a percentage of GDP)	0.40

Province-level Economic Exposure



Description of a recent major event

Recent Major Loss Events[14]

Year	Event	Magnitude or Affected area	Deaths	Total loss (bill. USD)
2019	Flood	NA	206	0.10
2018	Earthquake/Tsunami	M7.5	4340	1.45
2010	Earthquake/Tsunami	M7.8	530	NA
2009	Earthquake	M7.6	1195	2.20
2006	Earthquake	M6.3	5778	3.10
2004	Earthquake/Tsunami	M9.1	165708	4.45

2018 Sulawesi Earthquake: The 7.5 magnitude earthquake struck the island of Sulawesi on 28 September 2018 at 6:02 pm local time, approximately 78 km north of Palu, a coastal city with around 330,000 residents. The epicentre was located at [−0.22°S,119.85°E] at a depth of 20 km northeast of Donggala City[15]. The earthquake triggered mudflows and a 3-4 m high tsunami, that impacted the coastal areas of western Central Sulawesi, including Palu City and Donggala, a regency with a population of 275,000. The tsunami waves reached as high as 6 m in Palu bay. The earthquake and subsequent tsunami led to 4,340 fatalities, 10,000 or more injuries, more than 100,000 damaged or destroyed houses, and total economic loss of USD 1.45 billion[14,16].

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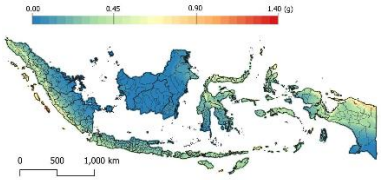
Major Fault Systems

Indonesia is surrounded by three major active tectonic plates of the earth: Eurasian, Indo-Australian, and Philippine plates. The Indian-Australian plate converges obliquely at about 50 to 70 mm/yr[17,18]. The tectonic features that affected Sumatra and Java regions are divided into three classifications: subduction zones, transform zones, and diffuse seismicity zones. The earthquake sources of Indonesia are broadly classified into Sumatra segment, Java segment and Sunda Strait[19]. The seismic source zones of Sumatra segment is further divided into subduction and transform fault. The Sumatra subduction has generated major earthquakes historically and in recent times[20]. The Java segment is also divided into subduction, transform and diffuse seismicity[21]. Sunda Strait is located in the transitional zone between the Sumatra and Java segments and is active in terms of its volcanism and seismicity

PGA Map
(Source: ICRM)



Meteorology

The annual percentage of rainy days in Southeast Asia varies from 30% in Central Thailand and Cambodia to 75% in Central Borneo. The rainfall variability is mainly determined by the large-scale monsoon systems, intra-seasonal oscillations, and the complex terrain. Southeast Asia experiences two monsoons: the southwest monsoon from June to September and the northeast monsoon from November to March. June-August months form the main rainy season in continental Southeast Asia, while December-February months are the rainy months south of 5°N.

The climate of Indonesia is humid tropical with the wet season between November and April, and a dry season from May through October. Rainfall displays large seasonal and spatial variability as Indonesia is straddled across the equator and due to local factors induced by complex topography.

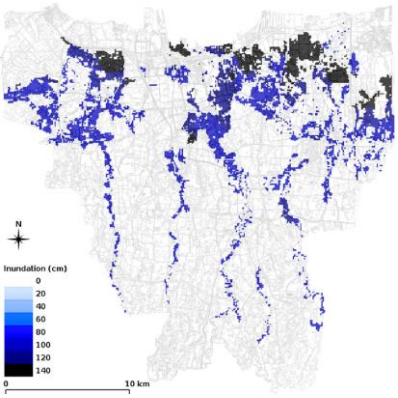
Climate classification[23]: Tropical rainforest in Sumatra, Borneo and west Papua; Tropical monsoon and savannah climate in east Java and Tenggara islands.

Average annual rainfall[24,25]: 2,702 mm; ~1000 mm in south-eastern Indonesia (east Nusa Tenggara Islands) and ~4000 mm in Central Borneo.

Average monthly rainfall[25]: 290 mm (January) – 170 mm (July/August) – 290 mm (December); Annual cycle varies with location.

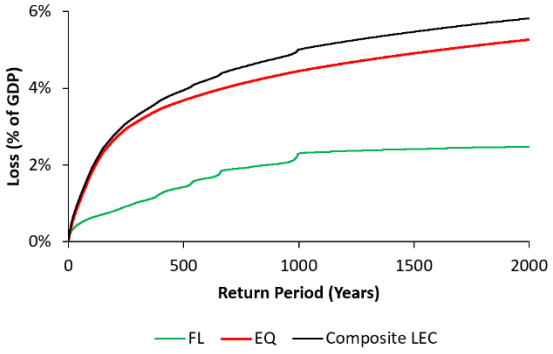
Average annual number of rainy days[24]: 88-210; lower values in East Kalimantan

50-yr flood hazard map for Jakarta[22]

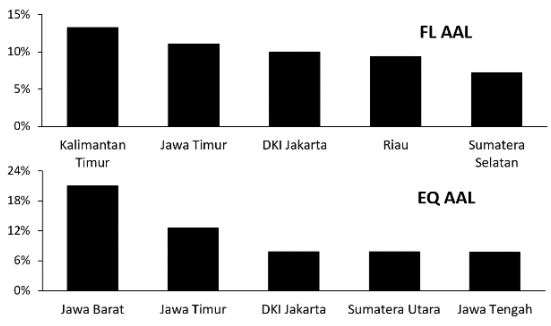


2019 Loss Values

Loss Exceedance Curves
(Source: ICRM)



% of Country's AAL (Top 5 Provinces)
(Source: ICRM)



Data sources

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Contact
Email: ExecDir-ICRM@ntu.edu.sg
ADRFI-2 Programme Office
Institute of Catastrophe Risk Management
Nanyang Technological University, Singapore