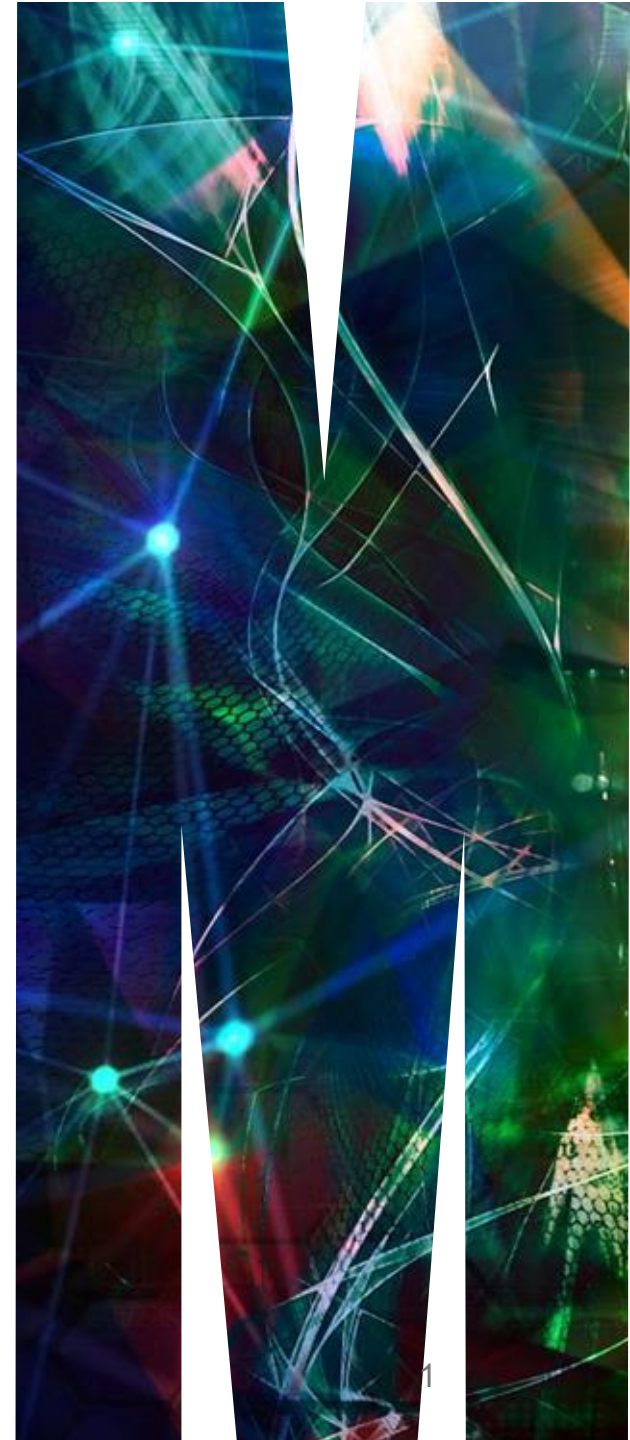


Budgeting for Disaster Response and Mitigation

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Monash University, Indonesia
April 28, 2026

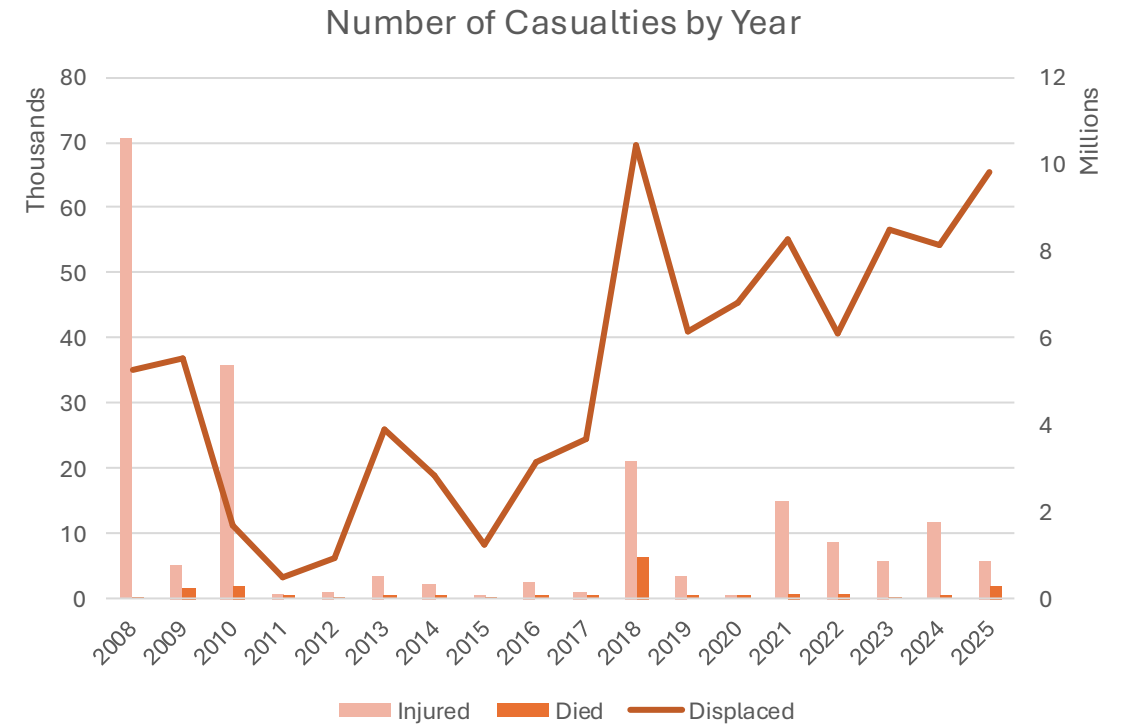
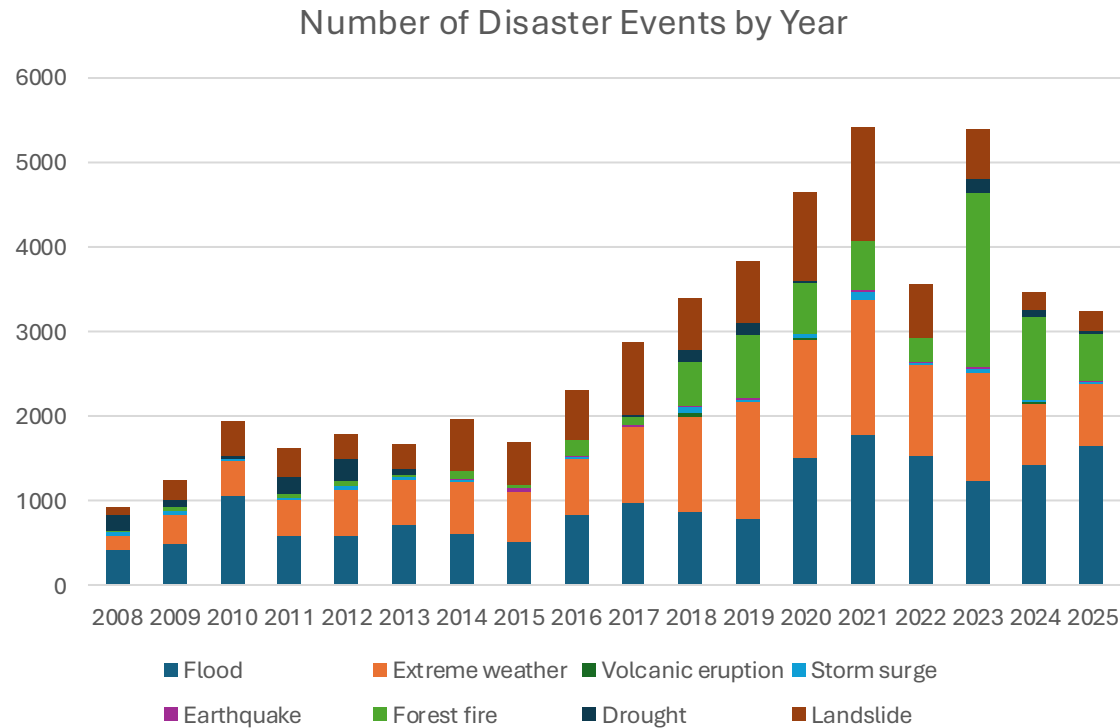


More than 600 killed, hundreds still missing after heavy floods, landslides across Indonesia

Watch:

https://www.youtube.com/watch?v=Lf2V-D_thMc

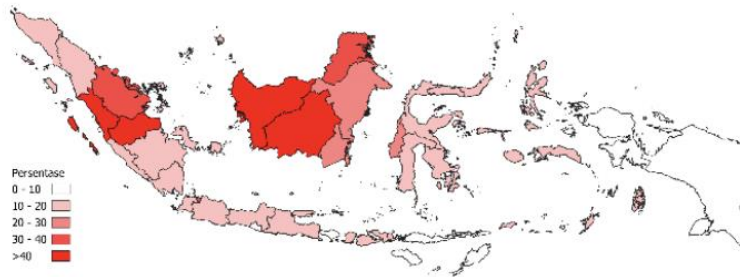
Disasters have become more frequent and more intense...



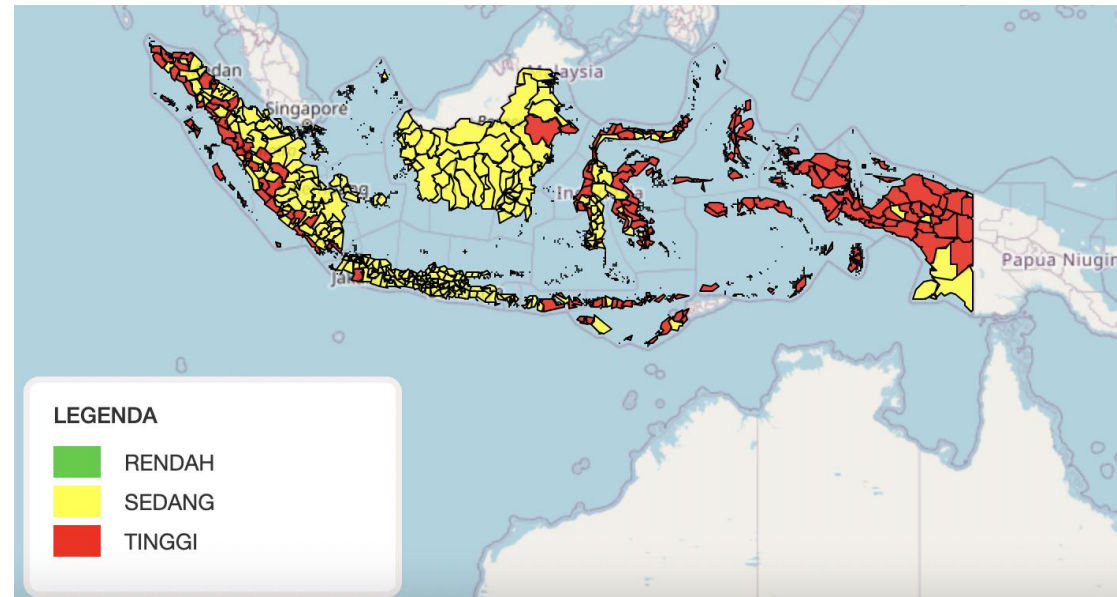
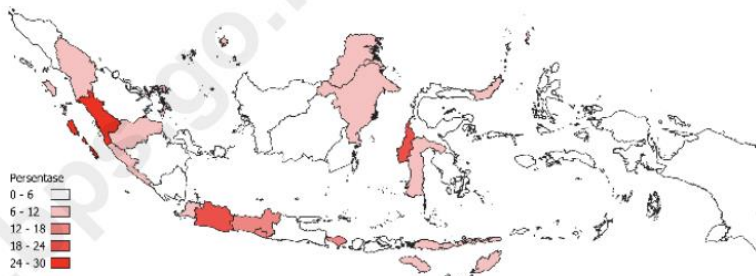
Source: BNPB (2026), author's analysis

Disasters have become more frequent and more intense... and risks are widespread across Indonesia

Persentase Desa/Kelurahan yang Mengalami Banjir Tahun 2024



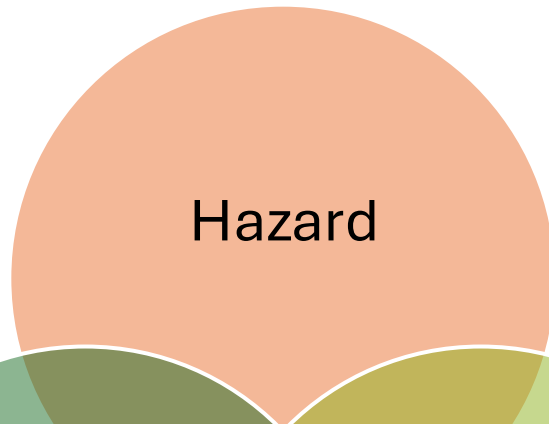
Persentase Desa/Kelurahan yang Mengalami Tanah Longsor Tahun 2024



Source: BPS (2025, 2026)

What is a disaster risk?

Potential occurrence of a physical event that may cause harm (e.g., flood, earthquake, extreme weather)



Hazard

People and infrastructure located in hazard-prone places (e.g., coastal areas, seismic regions)

Exposure

Susceptibility to harm and lack of coping capacity (e.g., poorly constructed building, poverty)

Vulnerability

Source: IPCC (2014)

Questions to discuss:

1. WHY should the government intervene?

Market failure vs. government failure



Almost no
government
intervention
(Market failure)



Inappropriate
government
intervention
(Government failure)

Source: IMDb (2025)

Questions to discuss:

1. WHY should the government intervene?
2. HOW should the government intervene?

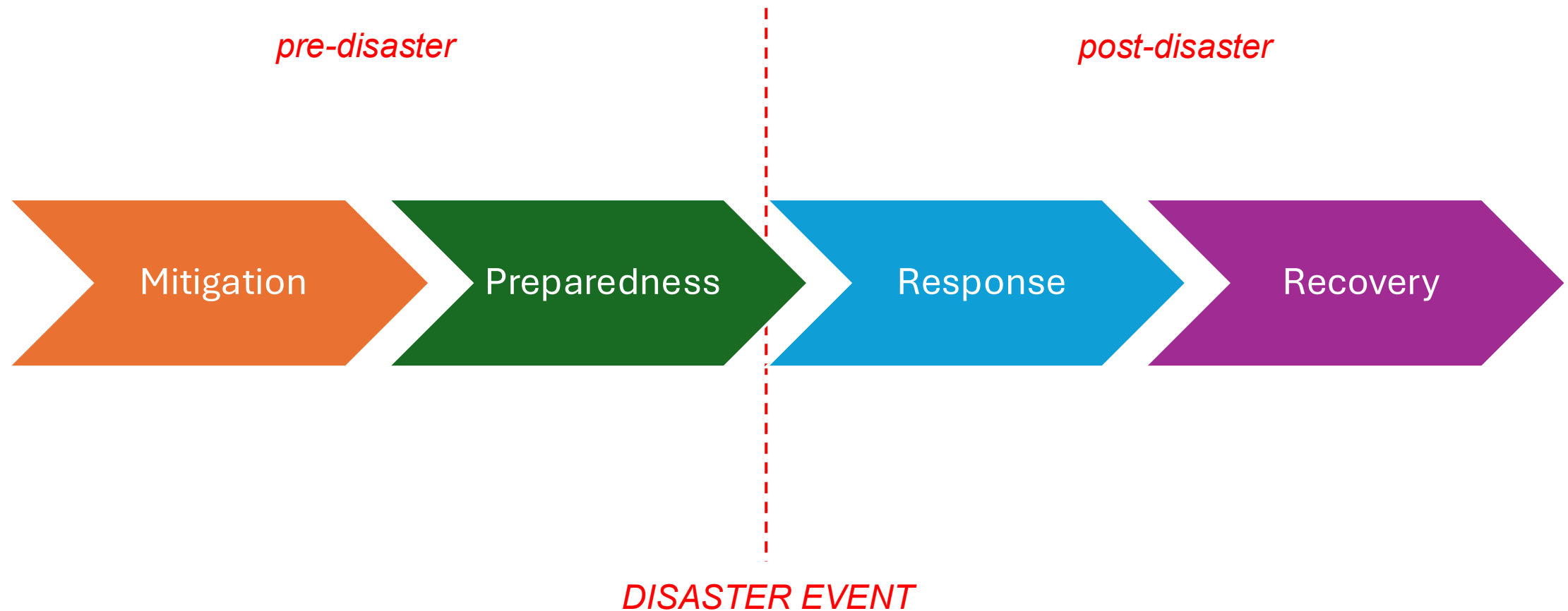
Core policy problem

Governments do not choose disasters vs. no disasters.

They choose how to manage risk and reduce impacts.

What framework helps guide these choices?

Comprehensive emergency management framework



Source: National Governors' Association (1979)

Is this a mitigation or response system? (1)

It took less than a week to fix this massive sinkhole in Japan | Insider Tech

Watch:

<https://www.youtube.com/watch?v=t2KtwdGhkqw>

Is this a mitigation or response system? (2)

How the U.S.'s National Emergency Alert System Works | WSJ

Watch:

<https://www.youtube.com/watch?v=kA3q7thOQ68>

Questions to discuss:

Imagine it is 2020-2021, and our country is in the midst of the COVID-19 pandemic.

What would be the likely immediate implications for the national budget? Structure your responses into two categories:

1. Revenue side
2. Expenditure side

Revenue is under pressure as economic activity declines. Expenditure rises as communities need support.

Table 2.4 Budget structure FYs 2015–2021 (in trillion Rupiah)

	(1) 2015	(2) 2016	(3) 2017	(4) 2018	(5) 2019	(6) 2020 (Original budget)	(7) 2020 (Amended budget I)	(8) 2020 (Amended budget II)	(9) 2021
Revenue (tr Rp)	1793	1822	1750	1895	2165	2233	1761	1699	1743
Spending (tr Rp)	(2039)	(2095)	(2080)	(2221)	(2461)	(2540)	(2614)	(2739)	(2750)
Deficits (tr Rp)	246	273	330	326	296	307	853	1039	1006
GDP (tr Rp)	11,526	12,402	13,590	14,839	15,832	17,443*	16,824*	16,391	17,656
Deficits to GDP (%)	2.20	2.15	2.41	2.19	1.84	1.76	5.07	6.34	5.70
Debt to GDP (%)	27.43	28.33	29.40	29.98	29.80			38.68	

Notes: Revenue, spending, deficit, and deficit to GDP ratio are ex-ante estimates according to the budget law of 2015, 2016, 2017, 2018, 2019, and 2020, as well as the two budget revisions as per Presidential Regulations No. 54 of 2020 and No. 72 of 2020. Star (*) marks data that are imputed due to unavailability from the primary source. GDP estimates are from Statistics Indonesia (2021) and Ministry of Finance (2021a). Debt to GDP figures are estimates from Katadata (2021). Exchange rate for 1 USD is around 14,300 Rupiah (Rp) as of November 2021 (Bank Indonesia, 2021). Numbers presented may not add up precisely due to rounding

Policy simulation:

Which one is more important: pre-disaster or post-disaster intervention?

Given government budget constraints, which should be prioritized: pre-disaster or post-disaster intervention?



BENCANA INDONESIA 2025

Jumlah kejadian bencana per tanggal 31 Desember 2025 tercatat sebanyak 4.727* kejadian. Kejadian bencana alam mendominasi adalah Bencana hidrometeorologi 99,26% dan bencana geologi 0,74% dengan urutan bencana banjir, cuaca ekstrem, karhutla, tanah longsor dan kekeringan.

BNPB

SEBARAN KEJADIAN BENCANA ALAM PERIODE 1 JANUARI - 31 DESEMBER 2025



TOTAL BENCANA TAHUN 2025

Update 31 Desember 2025

4.727*

DAMPAK BENCANA ALAM PERIODE 1 JANUARI - 31 DESEMBER 2025

MENINGGAL DUNIA	1.666
HILANG	214
LUKA - LUKA	6.799
MENDERITA & MENGUNGI	12.110.618

JUMLAH KEJADIAN PER-JENIS BENCANA TAHUN 2025

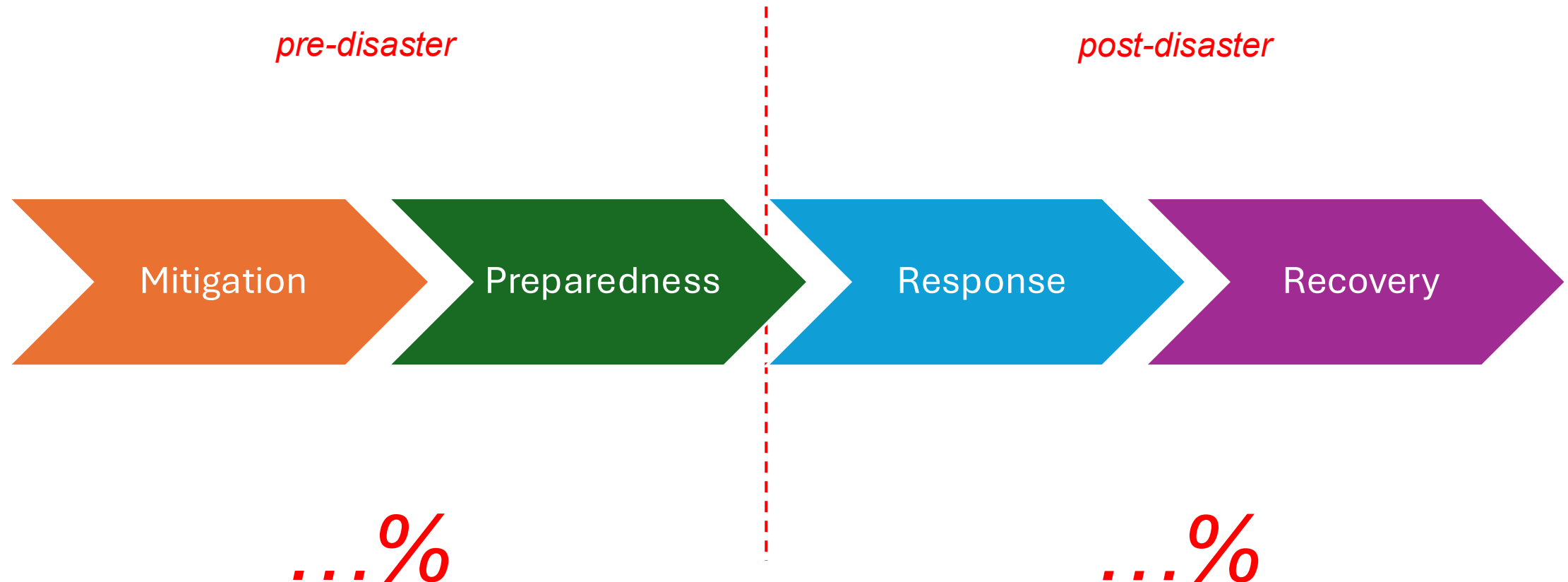
BENCANA ALAM	
GEMPA BUMI	28
ERUPSI GUNUNGAPI	7
TSUNAMI	1
BANJIR	2.009
KARHUTLA	1.329
CUACA EKSTREM	958
TANAH LONGSOR	330
KEKERINGAN	37
GELOMBANG PASANG & ABRASI	28

DAMPAK KERUSAKAN AKIBAT BENCANA ALAM TAHUN 2025

RUMAH RUSAK - TOTAL : 281.199 UNIT	FASILITAS RUSAK - TOTAL : 3.642 UNIT	KANTOR & JEMBATAN RUSAK - TOTAL : 1.343 UNIT
RUMAH RUSAK BERAT : 69.049	SATUAN PENDIDIKAN RUSAK : 2.206	KANTOR RUSAK : 263
RUMAH RUSAK SEDANG : 62.487	RUMAH IBADAT RUSAK : 1.225	JEMBATAN RUSAK : 1.080
RUMAH RUSAK RINGAN : 149.663	FASILITAS YANKES RUSAK : 211	

*Hasil Verifikasi Data Bencana Tahun 2025

Select one province and decide how you would allocate its 2026 budget to disaster management activities:



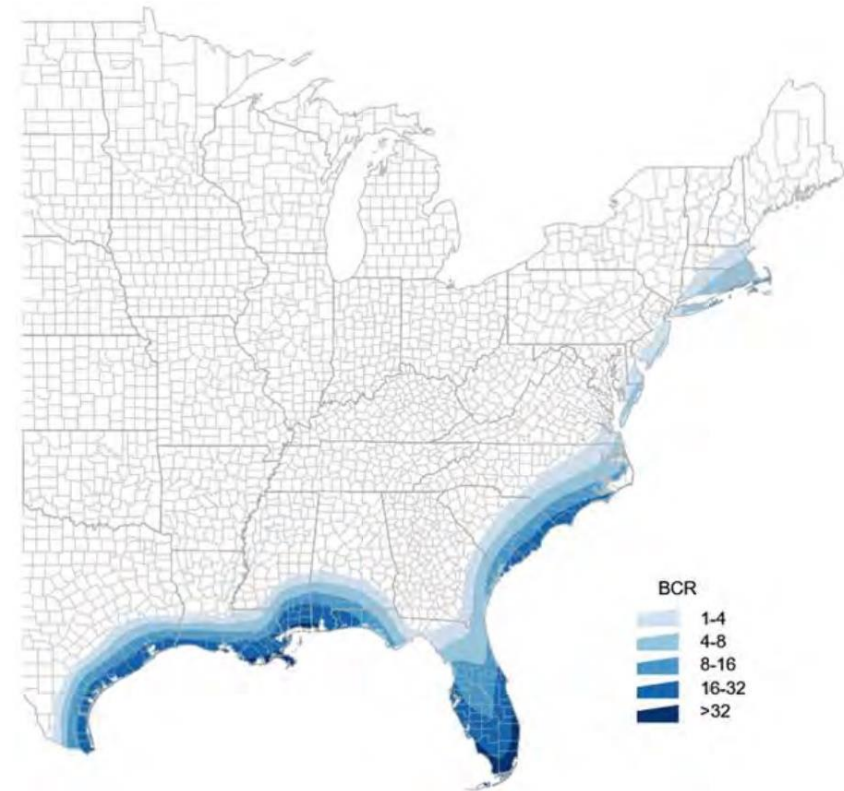
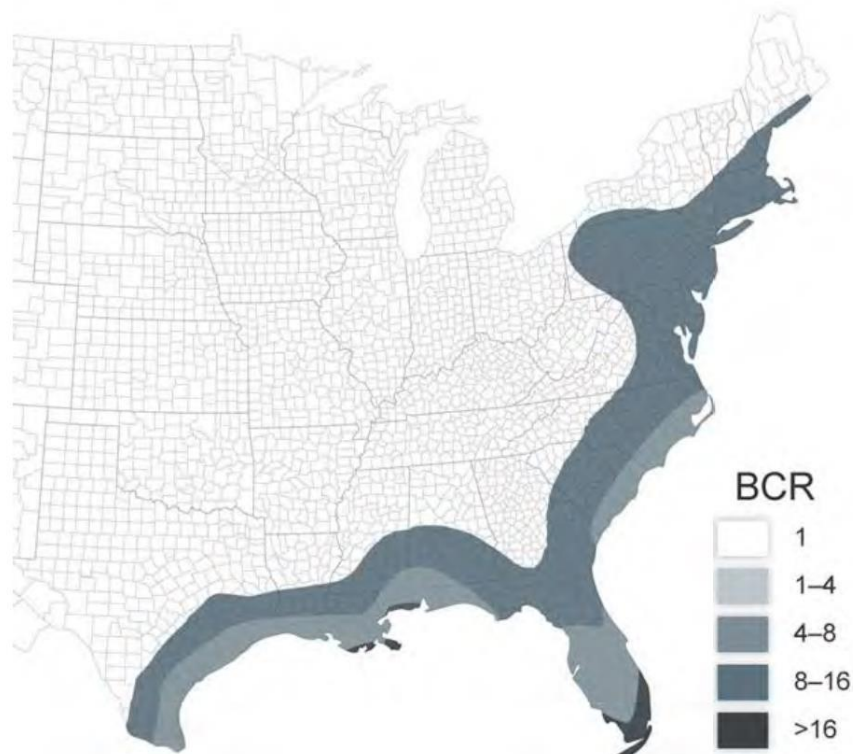
Mitigation ROI: 4:1

“The evidence is clear: When risk is reduced, countries and cities become more attractive to investors, businesses operate with greater certainty, and public resources can be directed more efficiently to job-creating priorities.

*World Bank research shows that increasing the resilience of infrastructure systems can yield **benefits of roughly four dollars for every dollar invested**—returns that arise not only from **avoided physical damage**, but from **reduced service disruptions, improved productivity, and more reliable access to jobs and markets.**”*

Source: World Bank (2019)

In the context of hurricanes, evidence from the United States suggests mitigation BCR can be as high as 32:1. Hence, the cost of inaction > the cost of action.



Source: Multi-hazard Mitigation Council (2019)

Policy simulation:

Suppose that in the 2026 budget, Papua Barat Daya Province allocates **Rp 7 billion** for emergency funding (*belanja tidak terduga*).

As of April 2026, the province has not experienced any disaster events, and no emergency response has been triggered. In preparation for the mid-year budget revision, the provincial government is considering whether to reallocate these idle funds toward alternative programs, such as:

- 1) Disaster mitigation: flood control infrastructure, early warning system
- 2) Economic development: financing support for small business, internet access expansion

Which allocation would you support, and why?

BENCANA INDONESIA 2026

Jumlah kejadian bencana per tanggal 22 April 2026 tercatat sebanyak 806 kejadian. Kejadian bencana alam mendominasi adalah Bencana hidrometeorologi 99,13% dan bencana geologi 0,87% dengan urutan bencana banjir, cuaca ekstrem, karhutla, tanah longsor, dan gelombang pasang/abrasi.

DAMPAK BENCANA ALAM

KORBAN BENCANA

MENINGGAL DUNIA	214
HILANG	13
LUKA - LUKA	1.669
MENDERITA & MENGUNSI	2.350.305

JENIS BENCANA ALAM

BENCANA GEOLOGI

GEMPA BUMI	6
ERUPSI GUNUNGAPI	1
TSUNAMI	-

BENCANA HIDROMETEOROLOGI

BANJIR	381
CUACA EKSTREM	250
KARHUTLA	82
TANAH LONGSOR	72
GELOMBANG PASANG / ABRASI	8
KEKERINGAN	6

SEBARAN KEJADIAN BENCANA ALAM 1 JANUARI - 22 APRIL 2026



TOTAL BENCANA TAHUN 2026

Update 22 April 2026

806

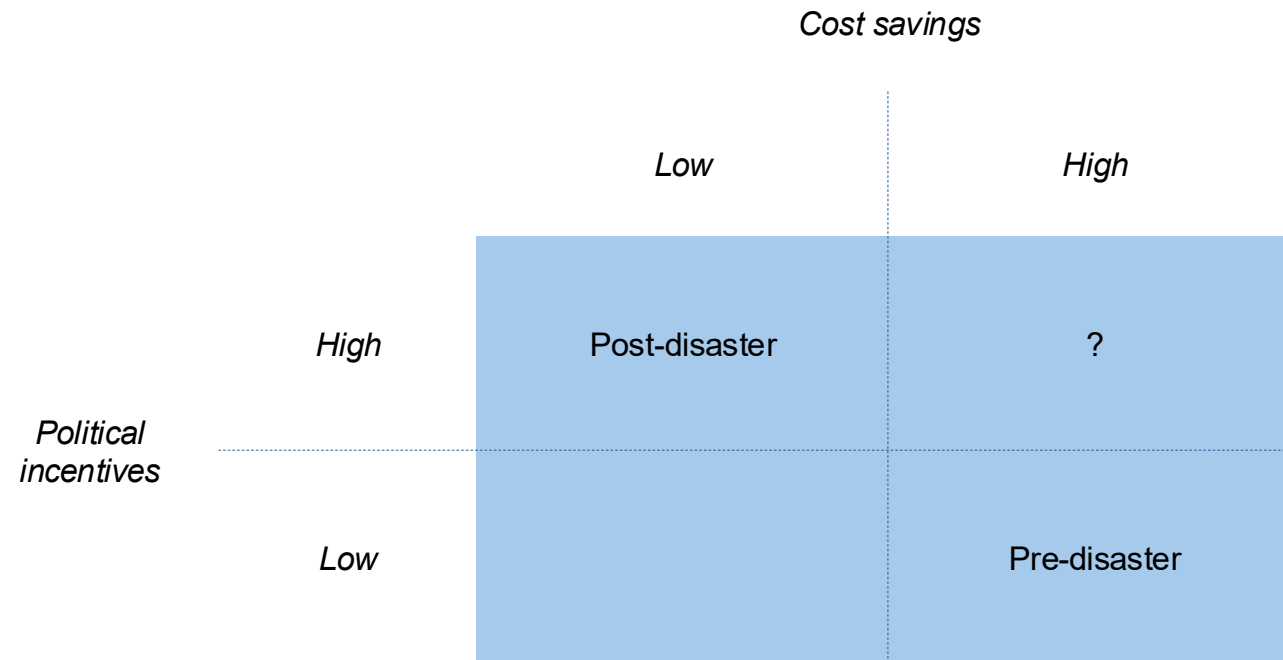
DAMPAK KERUSAKAN AKIBAT BENCANA ALAM

RUMAH RUSAK BERAT	1.669	SATUAN PENDIDIKAN RUSAK	43	KANTOR RUSAK	11
RUMAH RUSAK SEDANG	1.872	RUMAH IBADAT RUSAK	94	JEMBATAN RUSAK	52
RUMAH RUSAK RINGAN	5.390	FASILITAS YANKES RUSAK	35		

JUMLAH KEJADIAN

	< 50
	50 - 150
	> 150

Political vs. fiscal logics of disaster finance



Myopic voters and natural disaster policy

TABLE 5. Voter Responses to Relief and Preparedness Spending

	All Preparedness		Flow Preparedness	
	(1)	(2)	(3)	(4)
Disaster damage measure	-.048 (.078)	-.062 (.075)	-.049 (.078)	-.055 (.072)
Relief spending measure	.347** (.116)	.454** (.133)	.347** (.116)	.456** (.133)
Preparedness spending measure	-.11 (.087)	-.136 (.104)	-.001 (.107)	-.142 (.124)
Lagged preparedness spending		-.052 (.138)		-.033 (.178)
Lagged preparedness spending* Disaster damage measure		.015 (.03)		-.018 (.04)
Incumbent party's previous vote share in the county	.935** (.013)	.938** (.014)	.935** (.013)	.938** (.014)
R ²	.927	.933	.927	.933
Number of observations	15,561	12,447	15,561	12,447

Notes: (a) Standard errors are corrected for clustering at the state * year level.
 (b) All regressions include county and year fixed effects.
 (c) * $p < .05$, ** $p < .01$ (two-tailed).

“Using data on natural disasters, government spending, and election returns, we show that voters reward the incumbent presidential party for delivering disaster relief spending, but not for investing in disaster preparedness spending. These inconsistencies distort the incentives of public officials, leading the government to underinvest in disaster preparedness, thereby causing substantial public welfare losses.”

Source: Healy and Malhotra (2009)

Presiden Mengunjungi Korban Banjir Kalideres

Sejumlah pejabat negara meninjau lokasi banjir di wilayah Ibu Kota. Presiden Megawati dan suami serta putrinya melakukan hal serupa di Cengkareng dan Duri Kosambi, Kalideres, Jakbar.

Oleh **Liputan6**
Diterbitkan 04 Februari 2002, 08:07 WIB



YouTube Search



Jokowi 'Berkantor' di Tengah Kepungan Asap di Riau

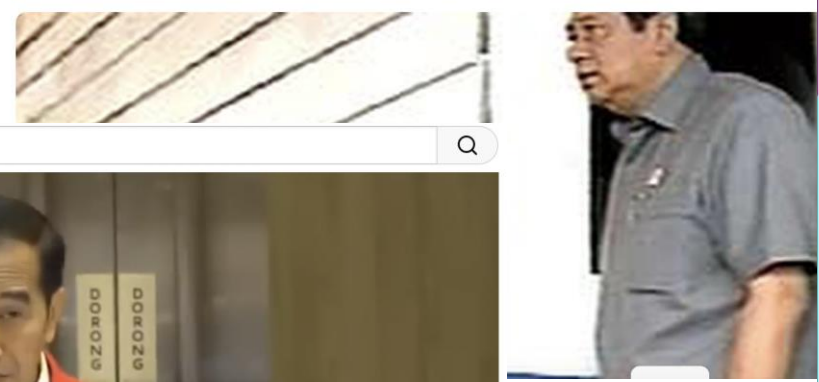
METRO TV 11.2M subscribers

784 likes Share Ask Save Download

Presiden SBY Kembali Mengunjungi Korban Tsunami Aceh

Kunjungan Presiden SBY ke Aceh ini adalah yang kali ketiga pasca-Tsunami, 26 Desember 2004 akan bertemu dengan mantan Presiden AS Bill Clinton yang menjadi utusan AS dalam penanganan bantuan Tsunami.

Oleh **Liputan6**
Diterbitkan 19 Februari 2005, 15:01 WIB



Kunjungi Korban Banjir Sumut, Prabowo Janji BBM-Listrik Segera Dipasok

Duka dari Utara Sumatera

Herdi Alif Al Hikam - detikFinance

Senin, 01 Des 2025 12:59 WIB



Foto: Cahyo - Biro Pers Sekretariat Presiden

Reflections:

Are we good with the current regulatory framework?

Regulatory framework for disaster finance: the U.S. case

Amy K. Donahue
University of Connecticut

Philip G. Joyce
The George Washington University

A Framework for Analyzing Emergency Management with an Application to Federal Budgeting

Emergency management is a complex policy subsystem that involves an intergovernmental, multiphased effort to mitigate, prepare for, respond to, and recover from disasters. This article develops a framework for analyzing the fiscal and functional aspects of disaster policy. It uses established theories of intergovernmental relations to offer a rationale for examining the capabilities required to implement disaster policy and the behavioral incentives that drive policy formulation. In particular, the article identifies the extent to which the capabilities and political objectives characteristic of each level of government are aligned, and illustrates the interplay between incentives and competencies by reviewing the federal disaster funding process. **The current rules for federal budgeting may inappropriately promote spending on disaster response and recovery, while de-emphasizing mitigation and preparedness.** Various proposals for reform could establish more coherent incentives, making disaster spending more consistent with the relative functional capabilities of the various levels of government.

“.... These budget authority and outlay caps did not allow the budget to grow as fast as inflation....”

.... PAYGO process... provided that changes in laws affecting revenues and mandatory spending that increased the budget deficit in any one year must be offset by deficit reductions such that the net effect of all changes is deficit neutral....

*An exception to the limitations of PAYGO and spending caps permits the president and Congress to declare certain spending as “emergency” spending. Because emergency spending is not subject to appropriations caps or to the PAYGO process, the president and Congress can finance disaster spending with supplemental appropriations rather than through the normal appropriations process. **Congress and the president could therefore, under this provision of the BEA, declare the increase in spending necessary to pay for disaster relief to be an “emergency.”***

Source: Donahue and Joyce (2001)

Law No. 24 of 2007 on Disaster Management (UU 24/2007 tentang Penanggulangan Bencana)

Article 16

To carry out the functions as referred to in Article 13 letter b, the disaster management managing executive shall receive integrated tasks during:

- a. pre-disaster;
- b. emergency response; and
- c. post-disaster period.

Pasal 16

Untuk melaksanakan fungsi sebagaimana dimaksud dalam Pasal 13 huruf b, unsur pelaksana penanggulangan bencana mempunyai tugas secara terintegrasi yang meliputi:

- a. prabencana;*
- b. saat tanggap darurat; dan*
- c. pascabencana.*

Government Regulation No. 21 of 2008 on the Implementation of Disaster Management

Article 21

- (1) Disaster management during the emergency response shall include: a. quick and appropriate study on location, damage, losses, and resources; b. decision on disaster emergency status; c. rescue and evacuation of disaster-affected community; d. fulfillment of basic necessities; e. protection for vulnerable group; and f. immediate recovery of essential facilities and infrastructure.
- (2) BNPB Head or BPBD head shall control disaster management during the emergency response as referred to in paragraph (1) in accordance with their respective authority.

Article 23

- (1) The government or regional governments shall decide on disaster emergency status as referred to in Article 21 letter b according to disaster level.
- (2) The President shall decide on disaster emergency status at the national level as referred to in paragraph (1), likewise the governor at the provincial level, and regent/mayor at regency/city level.

Article 24

Upon deciding on disaster emergency status, BNPB and BPBD shall have easy access to: a. mobilization of human resources; b. mobilization of equipment; c. mobilization of logistics; d. immigration, excise, and quarantine; e. licensing; f. procurement of goods/services; g. management of and accountability for money and/or goods; h. rescue; and i. command over agencies/institutions.

PP 21/2008 tentang Penyelenggaraan Penanggulangan Bencana

Pasal 21

(1) Penyelenggaraan penanggulangan bencana pada saat tanggap darurat meliputi: a. pengkajian secara cepat dan tepat terhadap lokasi, kerusakan, kerugian, dan sumber daya; b. penentuan status keadaan darurat bencana; c. penyelamatan dan evakuasi masyarakat terkena bencana; d. pemenuhan kebutuhan dasar; e. perlindungan terhadap kelompok rentan; dan f. pemulihan dengan segera prasarana dan sarana vital.

(2) Penyelenggaraan penanggulangan bencana pada saat tanggap darurat sebagaimana dimaksud pada ayat (1) dikendalikan oleh Kepala BNPB atau kepala BPBD sesuai dengan kewenangannya

Pasal 23

(1) Penentuan status keadaan darurat bencana sebagaimana dimaksud dalam Pasal 21 huruf b dilaksanakan oleh Pemerintah atau pemerintah daerah sesuai dengan tingkatan bencana.

(2) Penentuan status keadaan darurat bencana sebagaimana dimaksud pada ayat (1) untuk tingkat nasional ditetapkan oleh Presiden, tingkat provinsi oleh gubernur, dan tingkat kabupaten/kota oleh bupati/walikota.

Pasal 24

*Pada saat status keadaan darurat bencana ditetapkan, BNPB dan BPBD mempunyai kemudahan akses di bidang: a. pengerahan sumber daya manusia; b. pengerahan peralatan; c. pengerahan logistik; d. imigrasi, cukai, dan karantina; e. perizinan; f. **pengadaan barang/jasa**; g. **pengelolaan dan pertanggungjawaban uang dan/atau barang**; h. penyelamatan; dan i. komando untuk memerintahkan instansi/lembaga.*

Government Regulation No. 22 of 2008 on Disaster Finance and Aid Management

Article 11

Planning, budgeting, implementation, reporting, and accountability for the use of disaster management fund coming from APBN or APBD at pre-disaster stage shall comply with the provisions of legislation.

Article 12

Disaster management fund at pre-disaster stage shall be allocated for activities in the following situations: a. situation without disaster; and b. situation with potential disaster.

Article 13

Disaster management fund the use of in a situation without disaster referred to in Article 12 letter a shall include: a. facilitation for disaster management planning; b. disaster risk mitigation program; c. disaster prevention program; d. integration of development planning into disaster management planning; e. preparation of disaster risk analysis; f. facilitation for implementation and enforcement of spatial structure plan; g. education and training in disaster management; and h. preparation of technical standard for disaster management.

Article 14

(1) The use of disaster management fund in a situation with potential disaster as referred to in Article 12 letter b includes: a. alertness activities; b. development of early warning system; and c. disaster mitigation activities.

(2) Alertness activities as referred to in Paragraph (1) letter a shall use contingency fund referred to in Article 5 Paragraph (3) letter a.

PP 22/2008 tentang Pendanaan dan Pengelolaan Dana Bencana

Pasal 11

Perencanaan, penganggaran, pelaksanaan, pelaporan, dan pertanggungjawaban penggunaan dana penanggulangan bencana yang bersumber dari APBN atau APBD pada tahap prabencana dilakukan sesuai dengan ketentuan peraturan perundang-undangan.

Pasal 12

Dana penanggulangan bencana pada tahap prabencana dialokasikan untuk kegiatan dalam situasi: a. tidak terjadi bencana; dan b. terdapat potensi terjadinya bencana.

Pasal 13

Penggunaan dana penanggulangan bencana dalam situasi tidak terjadi bencana sebagaimana dimaksud dalam Pasal 12 huruf a meliputi: a. fasilitasi penyusunan rencana penanggulangan bencana; b. program pengurangan risiko bencana; c. program pencegahan bencana; d. pemaduan perencanaan pembangunan dengan perencanaan penanggulangan bencana; e. penyusunan analisis risiko bencana; f. fasilitasi pelaksanaan dan penegakan rencana tata ruang; g. penyelenggaraan pendidikan dan pelatihan penanggulangan bencana; dan h. penyusunan standar teknis penanggulangan bencana.

Pasal 14

- (1) Penggunaan dana penanggulangan bencana dalam situasi terdapat potensi terjadinya bencana sebagaimana dimaksud dalam Pasal 12 huruf b meliputi: a. kegiatan kesiapsiagaan; b. pembangunan sistem peringatan dini; dan c. kegiatan mitigasi bencana.*
- (2) Kegiatan kesiapsiagaan sebagaimana dimaksud pada ayat (1) huruf a menggunakan dana kontinjensi sebagaimana dimaksud dalam Pasal 5 ayat (3) huruf a.*

Reflections:

Are we good with the current regulatory framework?

Or do we *need* to revise the regulations to favor mitigation over response?

And do we *actually want* to?

Further discussion and questions may be directed to:
aichiro@monash.edu

More information on my research is available at:
asuryoprabowo.github.io