

National Action Plan for Climate Change Adaptation (RAN API)

Solo
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LCDI Secretariat
Directorate of Environmental Affairs
Ministry of National Development Planning/
BAPPENAS

RAN API Review Process



Climate
Projection



Hazard
Assessment



Economic
Valuation



National
Development
Planning



Adaptation
Strategy
Development



RAN API

- Atmospheric
- Oceanic

- **Marine & Coastal**
Wave height & Coastal

- **Water**
Water Security

- **Agriculture**
Rice production
- **Health**
Dengue fever cases

Avoid GDP loss

- **without adaptation:**
IDR 24.43
thousand trillion
- **with adaptation:**
IDR 24.49
thousand trillion

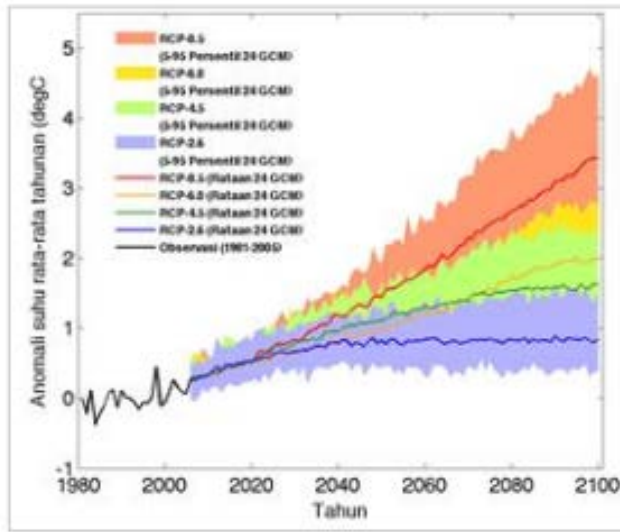
Integration of
Scientific
evidence into
the national
development
planning

- Integrated marine & coastal management
- Smart Water Management System
- Climate Smart Agriculture
- Protect the Community & Environmental Health

Consideration:

- Gender sensitive
- Vulnerable groups
- Ecosystem & landscape based
- Financial mechanism

Climate Projection Atmospheric



Highest change in average monthly temperature is projected to reach 1.3°C in southern Sumatera during august (2020-2045)

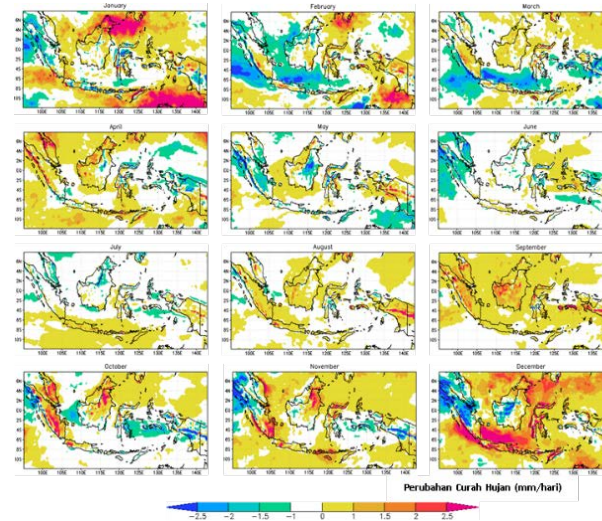


Data source and analysis



Temperature Increase
0.45-0.75°C

Perubahan Curah Hujan RCP4.5 2020-2035



Rainfall decrease up to 2 mm/day

- Jan: Sumatera, Jawa, Bali, Nusa Tenggara, Sulawesi, and Papua
- May-Jul: Jawa and NTT

Rainfall increase 1 – 2.5 mm/day

- Aug-Sep: evenly distributed



Rainfall Change
± 2.5 mm/day

Decadal and Extreme Climate Projection 2020-2024

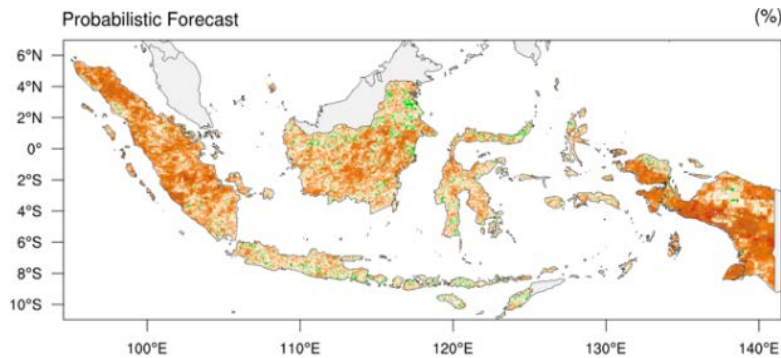
Drought Prediction

- Indonesia's rainfall will decrease significantly during El Nino and El Nino - positive *Indian Ocean Dipole* (IOD) at the same time
- Affected area: most of Indonesia, particularly Sumatera, Kalimantan, and Papua

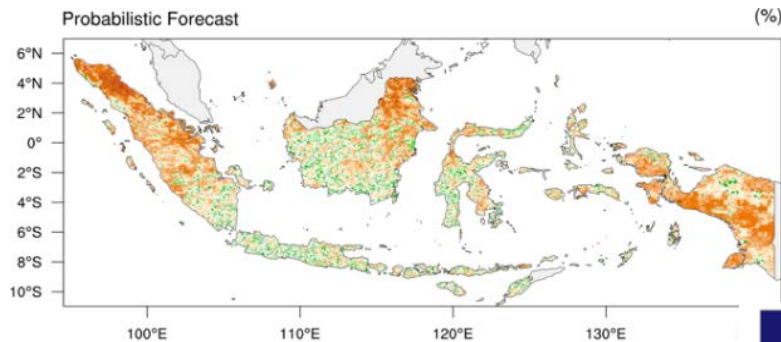
Flood Prediction

- The extreme Indonesia akan memiliki variasi iklim ekstrem basah di atas normal
- Affected area: southern part of Indonesia, southern part of Sumatera and Sulawesi, mostly Java Island and some of Nusa Tenggara and Maluku

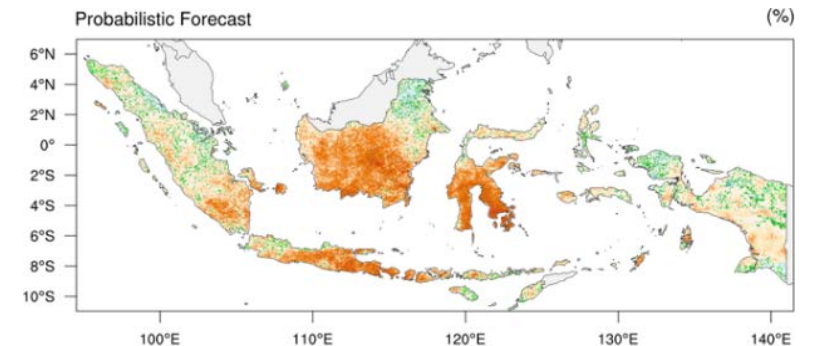
2020



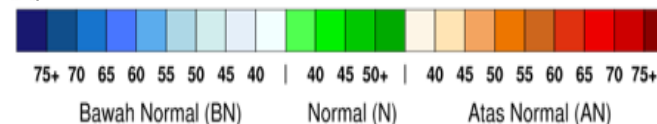
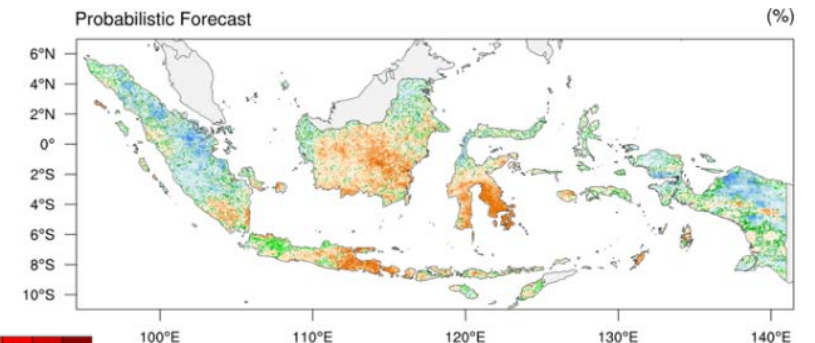
2024



2020



2024



Scientific Evidence

Scientific based assessments have been done for four priority sectors in 2018 based on climate projection
(Baseline data varies between 1990-2015 was projected up to 2045)



Equals to 5.8 million km² of Indonesian territorial waters is **dangerous** for <10 GT boats



Equals to 1,800 km of Indonesian coastlines are **highly vulnerable**



Rice production will **decrease** in several provinces



WATER SCARCITY
in 2024

Java Island will reach **439.21 m³** /capita/year

Nusa Tenggara Timur will reach **1,654 m³** /capita/year



Location where **dengue fever** is **very high**



Extreme wave height increase >1.5 m



Sea level rise 0.8-1.2 cm/year



Temperature Increase 0.45-0.75°C



Rainfall Change ± 2.5 mm/day

Potential Climate Hazard Water Sector

Bahaya Penurunan Ketersediaan Air Proyeksi 2020-2034



Bahaya Kekeringan Proyeksi 2020-2034



**WATER
SCARCITY
in 2024**

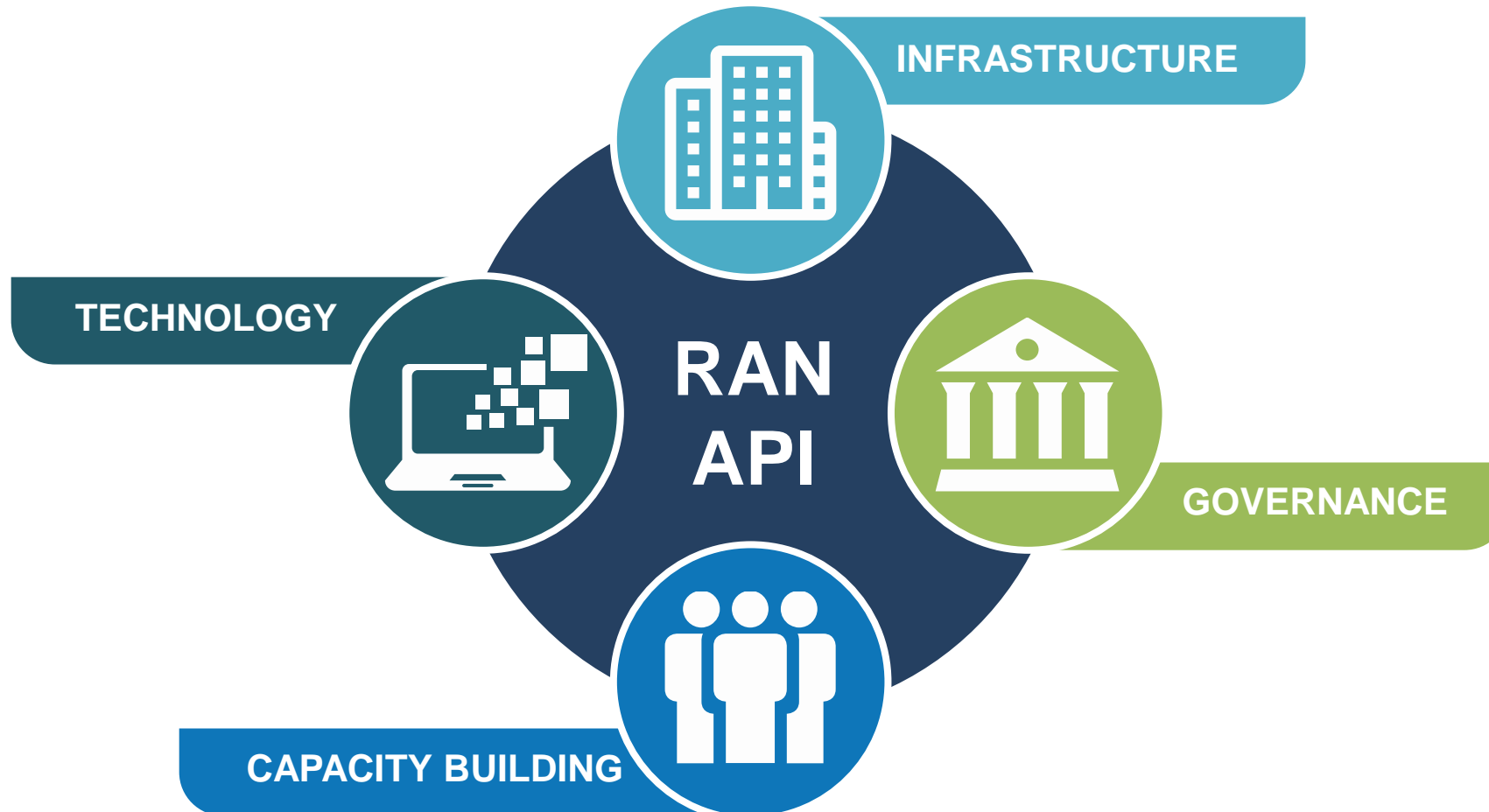
Java Island
will reach
439.21 m³
/capita/year

Nusa Tenggara Timur
will reach
1,654 m³
/capita/year

Affected province:

Aceh, Bali, Banten, Yogyakarta, Jakarta, Gorontalo, Jawa Barat, **Jawa Tengah**, Jawa Timur, Maluku Utara, Nusa Tenggara Barat, Nusa Tenggara Timur, dan Sumatera Utara

RAN API Framework



- To facilitate adaptation efforts in each priority sector through four clusters.
- To achieve climate-resilient development goals within the sustainable development framework.
- Considering the gender sensitivity and vulnerable group, ecosystem-based, landscape-based, and financial mechanism.

Delivery Strategy Development in 4 Priority Sectors



MARINE & COASTAL



WATER



AGRICULTURE



HEALTH

Infrastructure

Combine Ecosystem based Adaptation (EbA) & Community based Adaptation (CbA)

Increase water capacity for households, agricultural land, and industry in affected areas

Supply water for agriculture in food priority drought area

Consider the capacity of health facilities based on endemic locations

Technology

Implement extreme wave detection to reduce marine accidents

Distribute water to drought area (real-time)

Adopt and modify the technology to identify the plant growth and also monitor the water capacity and nutrition of the plant

Provide information system and EWS of dengue fever

Capacity Building

Provide alternative livelihood for small scale fisherman during extreme weather

Increase community's sense of belonging to use and manage water resources during drought

Increase farmer's understanding in climate information to adjust planting schedule

Increase community's awareness of climate related to diseases, particularly the vulnerable group

Governance

Supply regulation and information of marine safety and ships capacity

Develop or revise engineering design/ technical standard/ operational for an adaptive infrastructure

Develop integrated database as part of Climate Smart Agriculture (CSA)

Revitalize regulation, anticipation, & disease control program based on dengue fever's outbreak projection

Delivery Strategy Development Water Sector



Cluster	Delivery Strategy	Indicative Intervention
Infrastructure	<ul style="list-style-type: none"> Consider the area (ha) that are threatened by drought and flood. Calculate the capacity based on the number of households affected, the size of the agricultural area, and industry. Consider the numbers and locations of increasing rainfall intensity. 	<ul style="list-style-type: none"> Dam construction. Retention basin construction. Vegetation management at upstream area. Construction and structure adjustment for rain harvesting/provision for alternative sources of clean water.
	Adjustment for technical capacity based on rainfall projection.	Urban drainage width adjustment.
	Freshwater management in coastal areas by adjusting location, dimensions, and quantities based on the threat of sea level rise.	Construction and adjustment for infiltration well.
Technology	Efforts to redistribute water during heavy rain in potentially flooded areas.	Weather modification technology (rain reduction).
	Filling reservoir to meet fresh water demand.	Weather modification technology (rain enhancement).
	Increases water discharge into the aquifer.	Water injection technology.
	Distribute water to drought areas in real time.	Technology to detect leakage and identify water consumption needs

Delivery Strategy Development Water Sector



Cluster	Delivery Strategy	Indicative Intervention
Capacity Building	Increased of public awareness (sense of belonging) to utilize and manage water sources for supplies during drought.	<ul style="list-style-type: none"> • Increase public awareness. • Increase community capacity through training, campaigns, etc.
	Development or revision of adaptive Engineering Design/ technical standards/ infrastructure operational.	Technical input on the revision of national building and operational standards.
Governance	Determination of Ground Water Protected Areas (KLA) in watershed, to reforest and restrict forest utilization inside the KLA /catchment area.	Technical input on the policy set for KLA restrictions.
	Management of water resources to increase the water availability to meet water demand for households, agriculture and industry.	Issuance of Norm, Standard, Procedure, and Criteria (NSPK) of master plan development for a climate change adaptive drinking water supply system.
	Management of water resources to improve environmental quality.	Development of environmental water security.



Climate Resilience in RPJMN 2020-2024

Climate Resilience in National Development Planning



6th
**NATIONAL
PRIORITY**

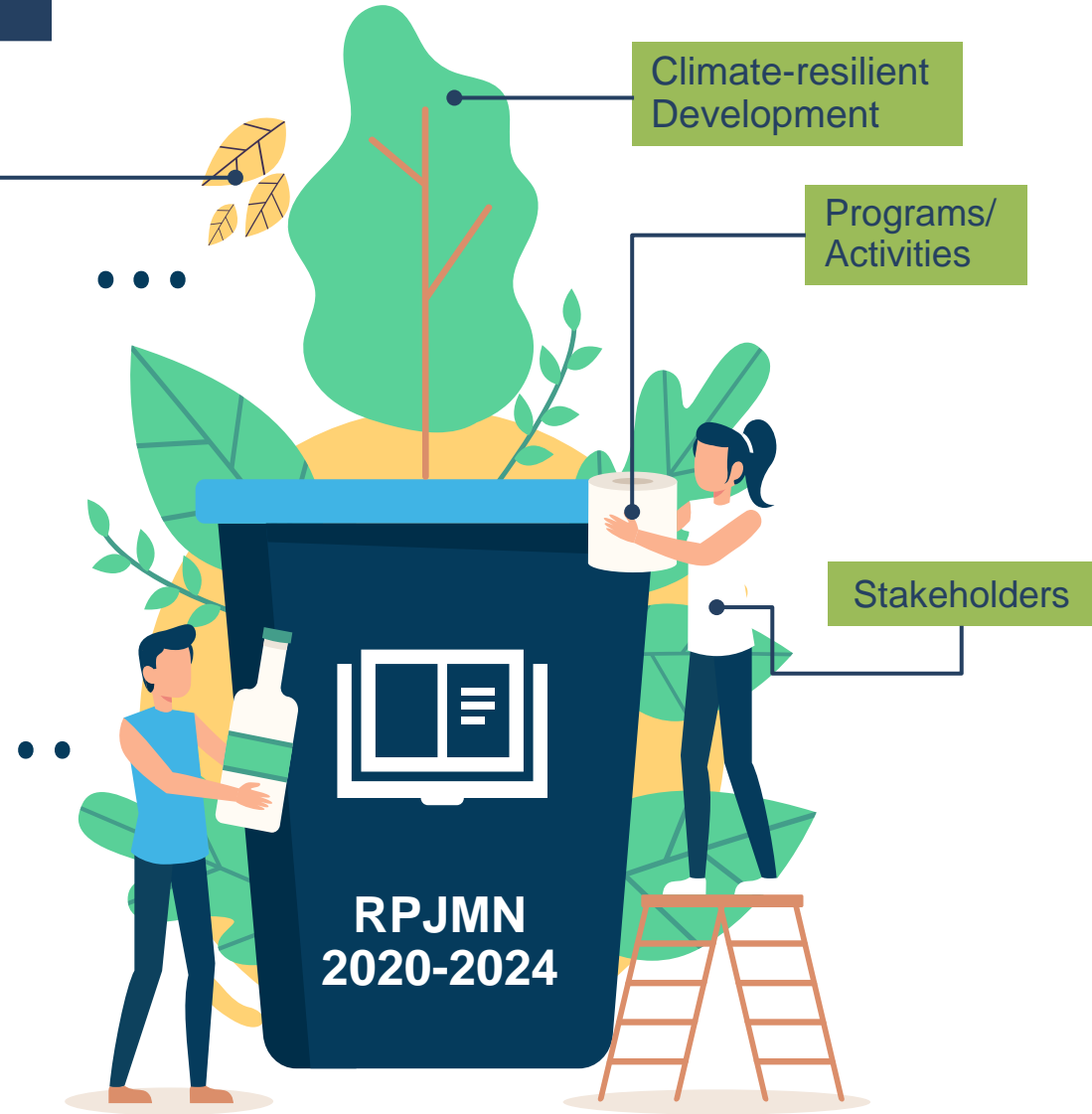
Building the
Environment,
Increasing Resilience to
Disasters, and Climate
Change

Potential loss
of disaster and
climate hazard

Climate-resilient
Development

Programs/
Activities

Stakeholders



Struktur Arah Kebijakan Adaptasi PI dalam RPJMN 2020 - 2024

PN 6: Membangun Lingkungan Hidup, Meningkatkan Ketahanan Bencana, dan Perubahan Iklim

3 Arah Kebijakan/
Program Prioritas (PP)

11 Strategi/Kegiatan
Prioritas (KP)

39 Proyek Prioritas
Nasional (Pro-PN)

Peningkatan Kualitas
Lingkungan Hidup



PP1

Pembangunan
Rendah Karbon

PP3



PN6

MEMBANGUN LINGKUNGAN HIDUP,
MENINGKATKAN KETAHANAN
BENCANA, DAN PERUBAHAN IKLIM



Peningkatan
Ketahanan Bencana
dan Iklim

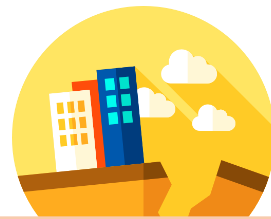
PP2



Struktur Program Prioritas (PP) 2 : Peningkatan Ketahanan Bencana dan Iklim

PN 6: Membangun Lingkungan Hidup, Meningkatkan Ketahanan Bencana, dan Perubahan Iklim

Kegiatan Prioritas 1: Penanggulangan Bencana



Pro-PN:

- 1) Penguatan Data, Informasi, & Literasi Bencana
- 2) Penguatan Sistem, Regulasi dan Tata Kelola Bencana
- 3) Peningkatan Sarana Prasarana Kebencanaan
- 4) Integrasi Kerjasama Kebijakan dan Penataan Ruang berbasis Risiko Bencana
- 5) Penguatan Penanganan Darurat Bencana
- 6) Pelaksanaan Rehabilitasi dan Rekonstruksi di Daerah Terdampak Bencana
- 7) Penguatan Sistem Mitigasi Multi Ancaman Bencana Terpadu

Program Prioritas 2: Peningkatan Ketahanan Bencana dan Iklim

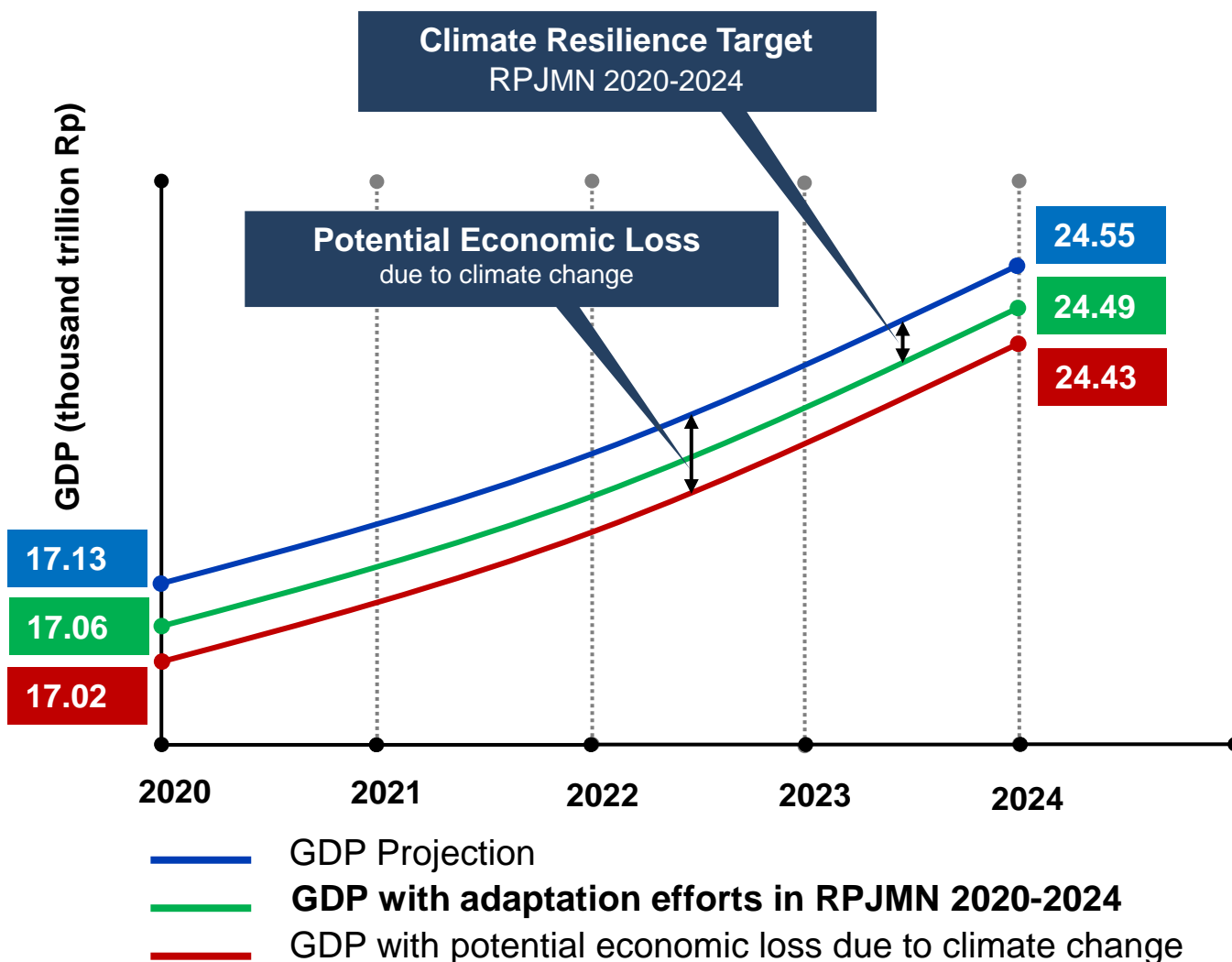
Kegiatan Prioritas 2: Peningkatan Ketahanan Iklim



Pro-PN:

- 1) Perlindungan Kerentanan Pesisir dan Sektor Kelautan
- 2) Peningkatan Ketahanan Air
- 3) Peningkatan Ketahanan Iklim pada Sektor Pertanian
- 4) Perlindungan Kesehatan dari Dampak Iklim

Adaptation Measures



To measure how well Indonesia is adapting to the impacts of climate change is not an easy task.

Indonesia sees the opportunity to measure adaptation by assessing the potential economic losses in four priority sectors.



Marine & Coastal Sector



Water Sector






Agriculture Sector



Health Sector

Arah Kebijakan, Sasaran, Target dan Indikator *Outcome*

PN 6 : Membangun Lingkungan Hidup, Meningkatkan Ketahanan Bencana, dan Perubahan Iklim

Arah Kebijakan	Sasaran	Indikator <i>Outcome</i> (satuan)	Baseline	Target	
				2020	2024
 <p>1. Meningkatkan Kualitas Lingkungan Hidup</p>	Meningkatnya Indeks Kualitas Lingkungan Hidup	Indeks Kualitas Lingkungan Hidup (IKLH)	65,14	68,71	69,74
		1. Indeks Kualitas Air (IKA)	51,01	55,1	55,5
		2. Indeks Kualitas Air Laut (IKAL)	N/A	58,5	60,5
		3. Indeks Kualitas Udara (IKU)	84,76	84,1	84,5
		4. Indeks Kualitas Tutupan Lahan dan Ekosistem Gambut (IKTL)	61,03	61,6	65,5
 <p>2. Meningkatkan Ketahanan Bencana dan Iklim</p>	Berkurangnya Kerugian Akibat Dampak Bencana dan Bahaya Iklim	Penurunan potensi kehilangan PDB akibat dampak bencana dan bahaya iklim terhadap total PDB (persen)	N/A	0,44	1,25
		1. Penurunan potensi kehilangan PDB akibat dampak bencana (persen)	0,08	0,10	0,10
		2. Penurunan potensi kehilangan PDB sektor terdampak bahaya iklim (persen)	N/A	0,34	1,15
		3. Kecepatan penyampaian informasi peringatan dini bencana kepada masyarakat (menit)	>5	5,0	3,0
 <p>3. Menerapkan Pendekatan Pembangunan Rendah Karbon</p>	Meningkatnya Capaian Penurunan Emisi dan Intensitas Emisi Gas Rumah Kaca Terhadap Baseline	Persentase penurunan emisi GRK nasional terhadap baseline (persen)	22,9	26,0	27,3
		Persentase penurunan intensitas emisi GRK nasional terhadap baseline (persen)	22,8	27,0	31,6
		1. Persentase penurunan emisi GRK terhadap baseline pada sektor energi (persen)	10,7	11,8	13,2
		2. Persentase penurunan emisi GRK terhadap baseline pada sektor lahan (persen)	43,1	45,8	58,3
		3. Persentase penurunanemisi GRK terhadap baseline pada sektor limbah (persen)	7,8	8,5	9,4
		4. Persentase penurunan emisi GRK terhadap baseline pada sektor IPPU (persen)	2,0	2,0	2,9
5. Persentase penurunan emisi GRK terhadap baseline pada sektor pesisir dan kelautan (persen)	6,3	6,5	7,3		

**Indikator, dan Target Proyek Prioritas
PP 2. Peningkatan Ketahanan Bencana dan Iklim
KP 2.2. Peningkatan Ketahanan Iklim**

No	Proyek Prioritas Nasional	Indikator (satuan)	Target	
			2020	2024
1	Perlindungan Kerentanan Pesisir dan Sektor Kelautan	Jumlah kawasan pesisir dan pulau - pulau kecil yang meningkat ketangguhannya terhadap bencana dan dampak perubahan iklim (kawasan)	12	12
		Jumlah pelabuhan yang memperoleh layanan informasi cuaca maritim dan prakiraan tinggi gelombang dengan akurasi lebih dari 80 persen (pelabuhan)	20	100*
		Panjang tanggul laut dan bangunan pengamanan pantai lainnya yang dibangun atau ditingkatkan (km)	22	42
2	Perlindungan Ketahanan Air pada Wilayah Berisiko Iklim	Tambahan debit air baku di kawasan Rawan Air (m3/detik)	2	5
		Jumlah wilayah sungai yang ditingkatkan ketahanan infrastruktur vitalnya terhadap risiko bencana dan perubahan iklim (wilayah sungai)	10	20
3	Perlindungan Ketahanan Pangan terhadap Perubahan Iklim	Jumlah unit bangunan konservasi air dan lingkungan hidup untuk penambahan areal pertanian (unit)	200	200
		Jumlah Penyuluh Pertanian dan Petani yang meningkat Pemahaman Iklim melalui Sekolah Lapang Iklim (orang)	1.000	1.650
4	Perlindungan Kesehatan Masyarakat dan Lingkungan dari Dampak Perubahan Iklim	Jumlah kab/kota yang menyelenggarakan Kabupaten/kota sehat (KKS) (kab/kota)	110	420

Program dan Kegiatan Ketahanan Iklim Sektor Air RPJMN 2020-2024



PROGRAM PRIORITAS (PP)/ KEGIATAN PRIORITAS (KP)/ PROYEK PRIORITAS (PROP)/ PROYEK	INDIKATOR	INDIKASI TARGET					INDIKASI PENDANAAN (Rp. Miliar)	LOKASI	INSTANSI PELAKSANA
		2020	2021	2022	2023	2024			
ProP : Perlindungan Ketahanan Air pada Wilayah Berisiko Iklim	Tambahan debit air baku di kawasan Rawan Air (m3/detik)	2	3	4	3	5	17,850.6		
	Jumlah wilayah sungai yang ditingkatkan ketahanan infrastruktur vitalnya terhadap risiko bencana dan perubahan iklim (wilayah sungai)	10	20	20	20	20			
<i>Pengembangan Sistem Data dan Informasi DAS Realtime</i>	<i>Jumlah Sistem Data dan Informasi DAS Realtime yang dikembangkan (sistem)</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>194.0</i>		<i>KLHK</i>
<i>Rehabilitasi Hutan dan Lahan secara Vegetatif</i>	<i>Luas hutan dan lahan yang direhabilitasi (ha)</i>	<i>56,000</i>	<i>40,000</i>	<i>30,000</i>	<i>25,000</i>	<i>20,000</i>	<i>5,740.5</i>	<i>33 provinsi</i>	<i>KLHK</i>
<i>Rehabilitasi Hutan dan Lahan Secara Sipil Teknis</i>	<i>Jumlah bangunan rehabilitasi sipil teknis yang terbangun (unit)</i>	<i>3,000</i>	<i>5,000</i>	<i>5,000</i>	<i>5,000</i>	<i>5,000</i>	<i>502.0</i>		<i>KLHK</i>
<i>Penyediaan air baku di Kawasan Rawan Air</i>	<i>Tambahan debit air baku di kawasan Rawan Air (m3/detik)</i>	<i>2.44</i>	<i>2.53</i>	<i>3.84</i>	<i>3.06</i>	<i>4.67</i>	<i>5,674.6</i>	<i>Tersebar</i>	<i>PUPR</i>
<i>Pembangunan infrastruktur hijau untuk mendukung ketahanan wilayah terhadap bencana banjir</i>	<i>Jumlah kolam retensi multifungsi yang dibangun atau ditingkatkan di wilayah sungai kritis</i>	<i>3</i>	<i>5</i>	<i>8</i>	<i>10</i>	<i>10</i>	<i>1,003.5</i>	<i>DAS Citarum, DAS Cisadane, DAS Ciliung, DAS Toba Asahan</i>	<i>PUPR</i>
<i>Pembangunan infrastruktur hijau untuk mendukung ketahanan wilayah terhadap bencana banjir</i>	<i>Jumlah kolam retensi multifungsi yang dibangun atau ditingkatkan di wilayah sungai prioritas</i>	<i>3</i>	<i>4</i>	<i>4</i>	<i>10</i>	<i>10</i>	<i>866.0</i>	<i>Diprioritaskan untuk wilayah sungai yang telah memiliki rencana induk ketahanan bencana banjir</i>	<i>PUPR</i>
<i>Pembangunan Infrastruktur sistem drainase utama perkotaan (kanal banjir, polder, pompa, dsb)</i>	<i>Jumlah kota dengan peningkatan sistem drainase utama (kota)</i>	<i>20</i>	<i>20</i>	<i>20</i>	<i>20</i>	<i>20</i>	<i>3,870.0</i>	<i>Diprioritaskan untuk wilayah sungai melintasi perkotaan yang telah memiliki rencana induk ketahanan bencana banjir</i>	<i>PUPR</i>



Thank
you



*Kementerian PPN/
Bappenas*

