GREEN & CLIMATE FINANCE IN EAST ASIA

PEMPAL Budget Plenary Meeting
March 24, 2023

PEMNA
Public Expenditure
Management Network in Asia

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Public Expenditure
Management Network in Asia

Note: The boundaries, colors, denominations and other information shown on any map in this work do not imply any judgement on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Member Countries

Brunei Darussalam	Mongolia
Cambodia	Myanmar
China	The Philippines
Indonesia	Singapore
Korea, Republic of	Thailand
Lao PDR	Timor-Leste
Malaysia	Vietnam

Global
Context

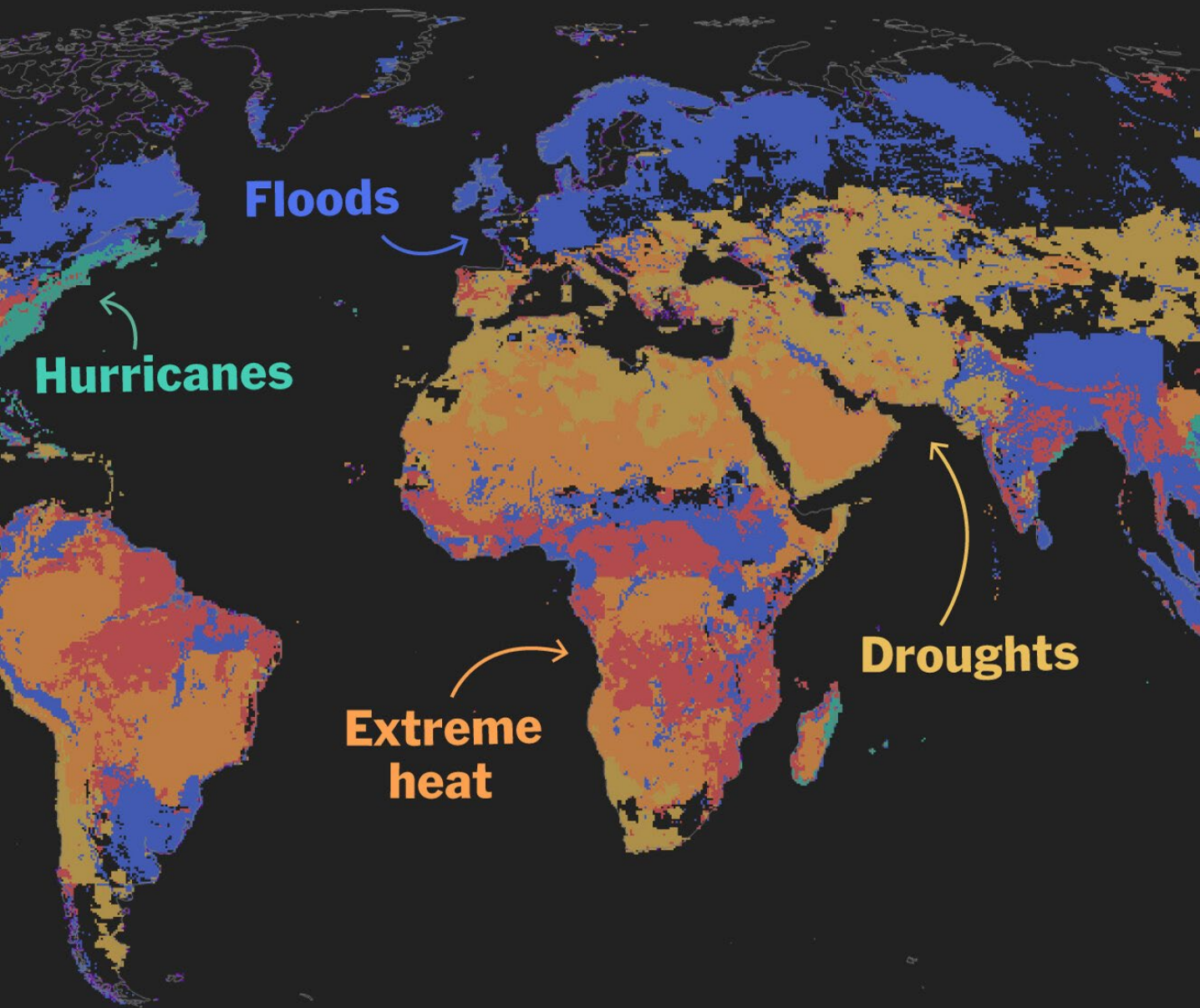Regional
Context

Floods

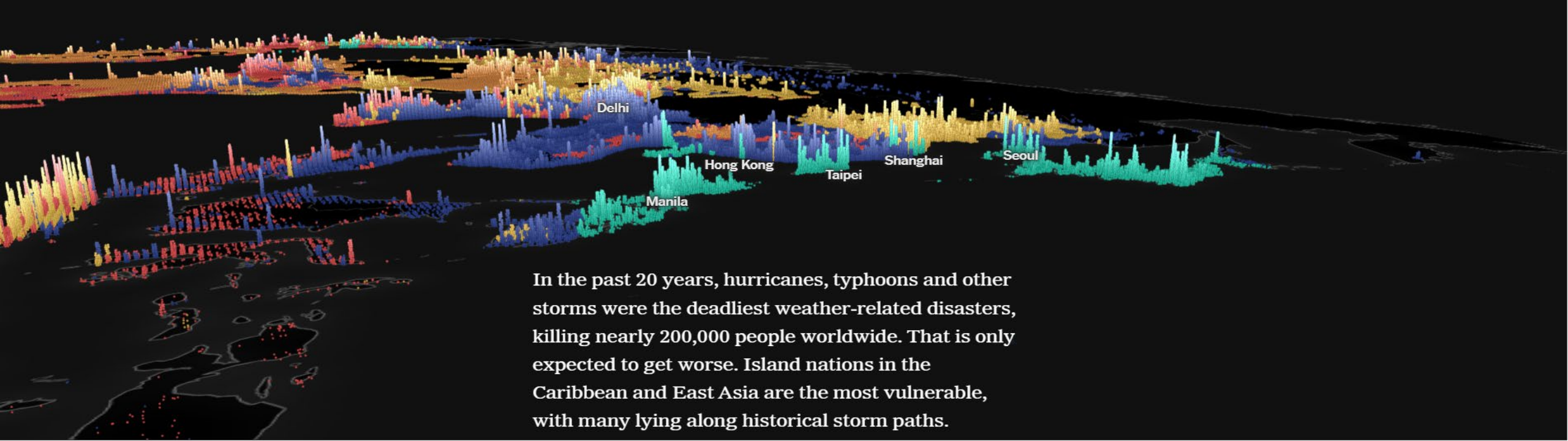Hurricanes

Extreme heat

Droughts

Low income

Middle income

High income
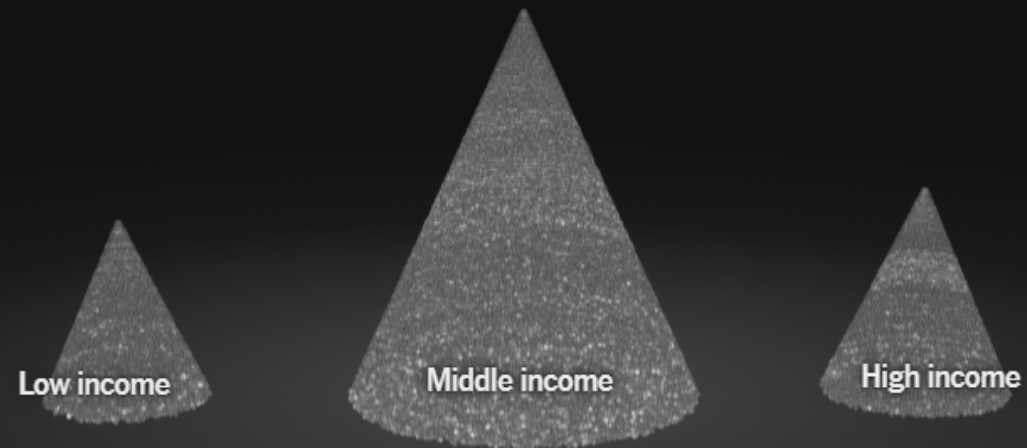
Then there is climate inequality. Most people at greatest risk from climate change live in low- and mid-income regions. A 2019 study found that climate change has already deepened global economic inequality by around 25 percent.

https://www.nytimes.com/interactive/2021/01/28/opinion/climate-change-risks-by-country.html
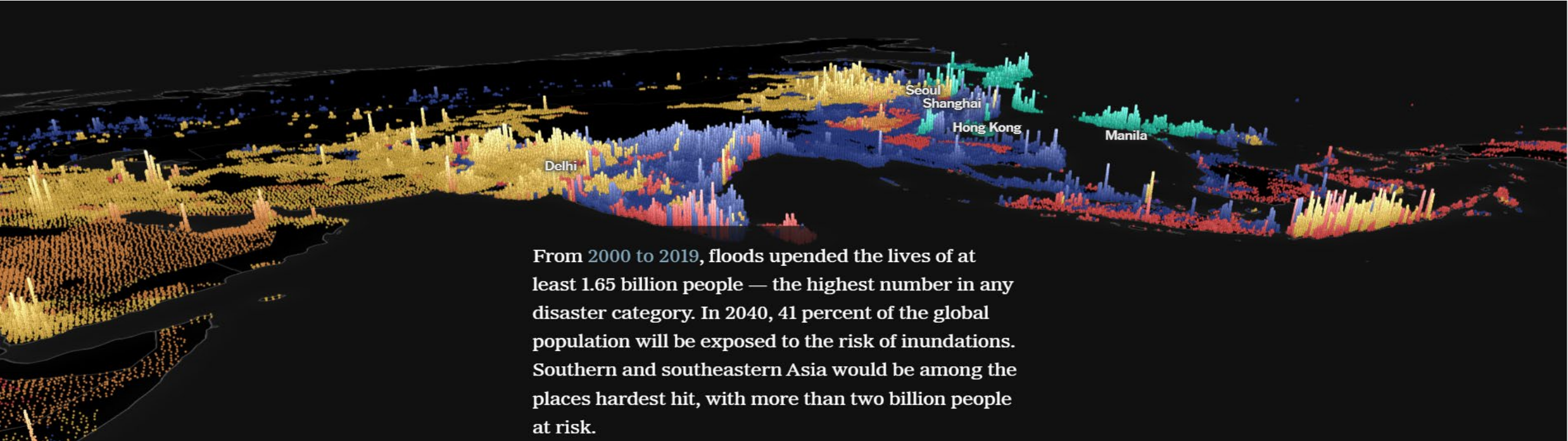
From 2000 to 2019, floods upended the lives of at least 1.65 billion people — the highest number in any disaster category. In 2040, 41 percent of the global population will be exposed to the risk of inundations. Southern and southeastern Asia would be among the places hardest hit, with more than two billion people at risk.

In the past 20 years, hurricanes, typhoons and other storms were the deadliest weather-related disasters, killing nearly 200,000 people worldwide. That is only expected to get worse. Island nations in the Caribbean and East Asia are the most vulnerable, with many lying along historical storm paths.
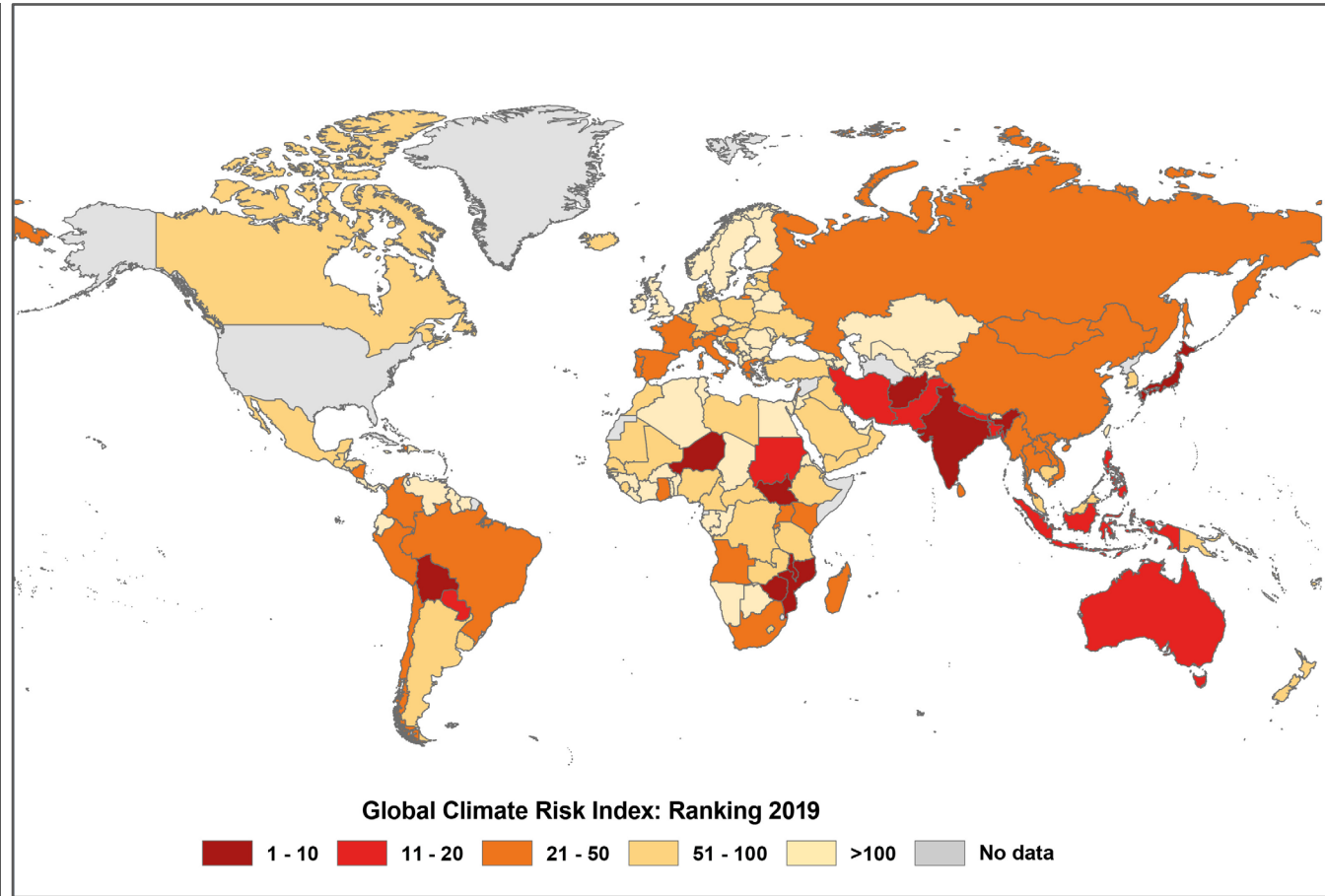
WHO SUFFERS MOST FROM EXTREME WEATHER EVENTS?

Six of Asia's countries are ranked among the world's top 10 countries most affected by climate risk based on frequency, death tolls and economic losses, according to the Global Climate Risk Index by think-tank Germanwatch.

7 Pakistan
1 Honduras
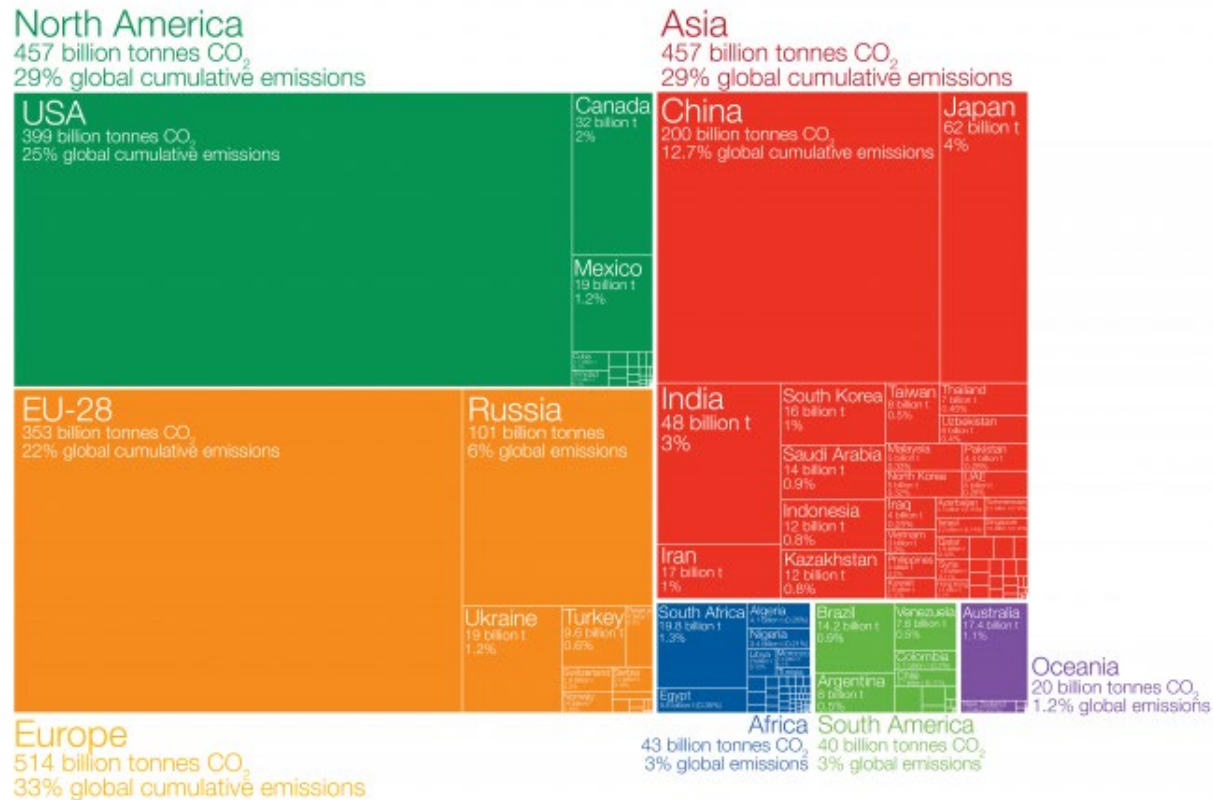2 Myanmar
9 Guatemala
3 Haiti
8 Vietnam
10 Thailand
4 Nicaragua
6 Bangladesh
5 Philippines

Compiled by: ANN/DataLEADS

Global Climate Risk Index: Ranking 2019

1 - 10   11 - 20   21 - 50   51 - 100   >100   No data

Global Challenges require a Global Response

172 countries (91.4% of global emissions) have submitted a **new or updated NDC**

107 of the 172 countries (79.6% of global emissions) have submitted a **new or updated NDC with reduced total emissions** compared to their previous NDC
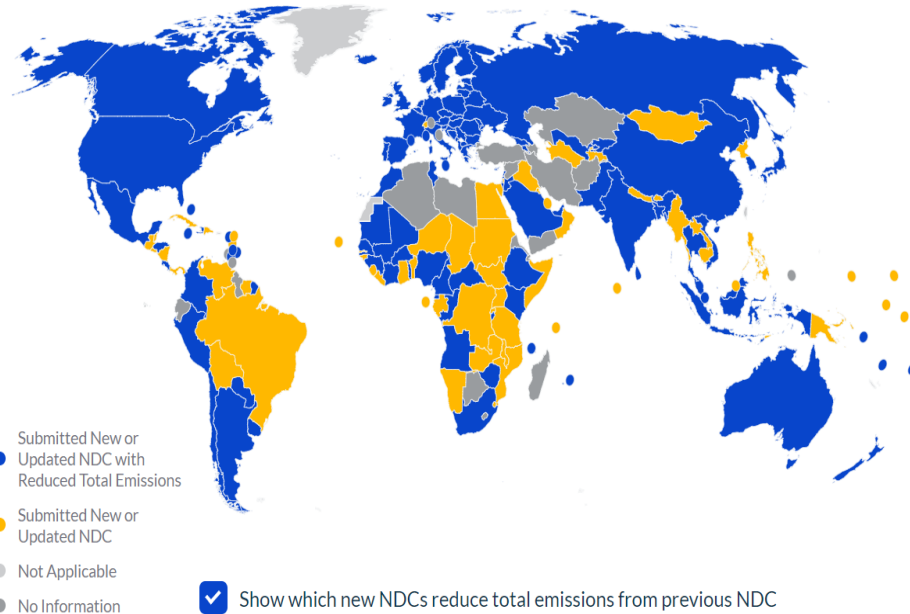
Click on the country or see table below to compare with previous NDC

Legend:
- ● Submitted New or Updated NDC with Reduced Total Emissions
- ● Submitted New or Updated NDC
- Not Applicable
- ● No Information

☑ Show which new NDCs reduce total emissions from previous NDC

Source: World Resources Institute https://www.wri.org/ndcs

CHINA: Committed to achieving carbon peaking before 2030 and Net Zero by 2060. Substantial but feasible investment needs, mostly in electricity (generation & grid) and transport (infrastructure, efficiency, electrification, and fuel switch): **totally 13.8T until 2060** (US$2T/1.1%GDP (2022-30), US$6T (2031-40), US$4.3T (2041-50), US$1.4T (2051-60) (undiscounted, WB estimates).

INDONESIA: Target Net Zero by 2050. Needs total investment of 77 Quadrillion Rupiah until 2060 **/ 5 times GDP in 2020** (GOI estimates). The estimated cost required for CC mitigation & adaptation 2015-2020 is US$81B. Economic loss annually due to CC in 2050 estimated to US$14.8B.

KOREA: Carbon Neutrality by 2050. Parallel efforts toward carbon neutrality, economic growth, and enhanced quality of life for all.

MALAYSIA: Target Net Zero by 2060. **Total 2022 allocation for SDG: RM309B (US$70B) (**GOM data).

MONGOLIA: Target Net Zero by 2050. Needs **US$ 11.5B** to meet NDC target (mitigation: US$6.3B / adaptation: US$5.2B) (GOV estimates).

THE PHILIPPINES: Development Plan (PIP) 2023-28 highlights **"Build, Better, More" Program** (~US$20B / 5% GDP) pursuing Sustainable Infrastructure Development & climate-smart asset management.

VIETNAM: Target Net Zero by 2050. Phased out coal power by 2040. Reverse deforestation by 2030. Total incremental financing needs ~ US$368B over 2022-40, or **6.8% GDP per year (2/3 for adaptation)** financed relatively equally by private and public actors (WB estimates).

Beyond the urgency of addressing the climate crisis, countries will benefit in many other ways from enhancing their NDCs

Business as Usual — **4–5°C**
Current Commitments — **2.9–3.4°C**
Paris Agreement Goal — **1.5–2°C**
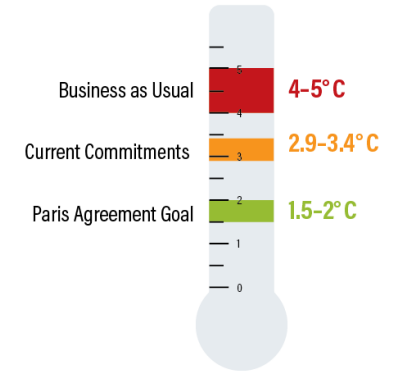
HOW TO GET TO NET-ZERO | Transition to a low-carbon economy

GHG emissions

BUSINESS AS USUAL

0

2010 2020 2030 2040 2050 2060 2070 2080 2090 2100

WORLD RESOURCES INSTITUTE

Taking advantage of major shifts in technology and costs

Seizing opportunities for economic growth and development

Avoiding lock-in effects and increased transition costs

Sending signals to attract climate finance and investment

Building on action by non-state actors, including cities and business

Achieving synergies with the SDGs (health, jobs, food, etc.)

Building broader buy-in from ministries and stakeholders

Bolstering implementation of commitments in existing NDCs

Aligning with carbon neutrality and long-term strategies

Greening:

Revenues
Expenditures

Assets

Liabilities

Greening the Whole-of-Government Balance Sheet

REVENUES

TAX REVENUES

Consumption / income taxes (VAT, CIT, SCT…)

Environmental Taxes

NON-TAX REVENUES

Infrastructure Service Tariffs

EXPENDITURES

RECURRENT SPENDING

Targeted green Subsidies

Ecological Transfers

CAPITAL SPENDING

Green Infra. & Procurement

Climate-informed PIM

ASSETS

NON-FINANCIAL ASSETS

Land

Green Buildings

Green Infrastructure

FINANCIAL ASSETS

SOE's Green Investment & Consumption

SPV Green Loans

DIGITAL ASSETS

Open Data

E-services

Digital Transformation

EQUITY / CAPITAL

ALL CAPITAL

Productive Capital

Physical Capital

Human Capital

Natural Capital

LIABILITIES

DIRECT LIABILITIES

Green Bonds

ODA/CL for Green Growth & Climate Resilience

CONTINGENT LIABILITIES

SOEs

PPPs

Climate / Disaster Risk Management

ENVIRONMENTAL/NATURAL CAPTIAL ACCOUNTING   **OPERATIONAL INTEGRATION**

Indonesia

FISCAL POLICY RESPONSE TO ADDRESS ENVIRONMENTAL ISSUES

Mitigation Fiscal Framework

Tax incentives to stimulate private participation

Climate Budget Tagging (Line Ministries) for CC Mitigation & Adaptation

Climate Budget Tagging (subnational) for CC Mitigation & Adaptation (2021: 7 provinces & 4 districts)

Fiscal Transfer (TKD) to increase subnational government participation (i.e., Specific Allocation Fund (DAK), Fiscal Incentives (DID), Reforestation Fund (DBH DR); and Intra-SNG's Specific Financial Assistance (BKK)

Innovative Financing to support sustainable development (i.e., Green bond/Sukuk)

FUTURE POLICY STRENGTHENING PLANS

Preparation of fiscal instruments related to the levy on carbon (carbon tax)

Preparation of the Climate Change Fiscal Framework (updating Mitigation Fiscal Framework)

Integration of national Climate Change Planning, Budgeting, and MRV Systems

Preparation of SDGs Government Securities Framework

Revenues Policy (Tax / Fee / Subsidy)

MONGOLIA:
- Tax incentives for an economic entity that support the green development, renewable energy sector. Livestock tax introduced since 2020 to reduce the excess capacity of pastures.
- Natural Resource Reserves Fee (land, water, forest use, plant use, hunting license) introduced since 2012. Used for environmental protection & rehabilitation measures. Pollution Fee (transport vehicles, raw coal, solvent).

SOUTH KOREA:
- ETS sales revenue (30%), Transportation tax (44%), other (26%) for Climate Response Fund.

VIETNAM:
- To reduce GHG (Environmental protection tax, natural resource tax, excise tax, EP fee for emission).
- To incentivize green actions (CIT, VAT, EIT, land-use tax, registration fee).

THAILAND:
- Excise tax on products causing negative externalities/ environmental damage, such as petroleum products, cars and motorcycles, with varying tax rates according to the level of carbon emissions.

MALAYSIA:
- Tax incentives for green technology e.g., Green Investment Tax Allowance (GITA) Assets and Projects, Green Income Tax Exemption (GITE), Electric vehicle (road tax exemption for individuals, CIT exemption and investment tax allowance (ITA) for manufacturers).
- Carbon Capture Storage (CCS) Tax Incentives with ITS of 100% of qualifying capital expenditure for 10 years.

CAMBODIA:
- Excise tax, aviation fee, carbon revenue, premium collection from projects identified through EIA (US$16.2M from 1,115 projects during 2017-22, mostly in mining and energy sectors)

INDONESIA:
- Tax incentives for the development of NRE and clean technology (including electric vehicles). Harmonizing taxes related to carbon emissions (e.g., excise, vehicle, and fuel taxes, and transfer of vehicle title fee), under HPP Law. Fuel subsidy revocation policy.
- Preparation of fiscal instruments related to the levy on carbon (carbon tax). Limited application of carbon tax (cap & tax) to coal-fired power plants at US$2/tCO2e.

GOVERNMENT OF MONGOLIA

Government of Indonesia

MONGOLIA · CHINA · SOUTH KOREA · LAOS · VIETNAM · THAILAND · CAMBODIA · PHILIPPINES · MALAYSIA · INDONESIA · EST TIMOR

AVERAGE REVENUE FROM ENVIRONMENTAL TAXES

OECD: **2.5%** of GDP

EU: **2.4%** of GDP and **6.0%** of Government Revenue from taxes and social contributions (TCS)

Environmental Tax Revenue in Asia Pacific (% of GDP)

Source: Adapted from Cottrell et al. 2017. Environmental Tax Reform in Asia and the Pacific
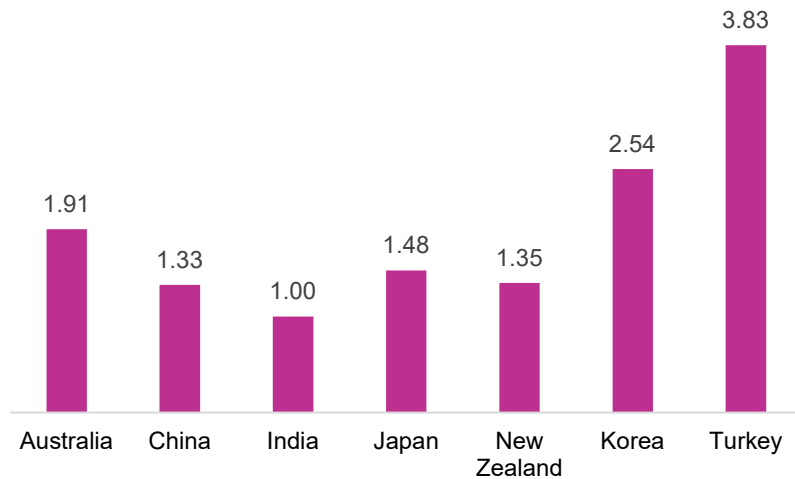
Environmental tax revenue by category as % of TSC and GDP, 2018 (%)

■ **Energy taxes** ■ **Transport taxes** ■ **Taxes on Pollution/Resources** ● **% of GDP**

Source: Eurostat (online data codes: env_ac_tax, gov_10a_taxag, nama_10_ma)

eurostat

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Carbon Markets Development

SOUTH KOREA:
- Emissions Trading Scheme (K-ETS) introduced in 2015 (transitional step since 2010), now phase three. A cost-effective measure: emission allowances issued annually to large GHG emitters and surplus be traded/auctioned (in 2023, 713 large emitters (> 125K), price 23/03 ~ US$10, upward trading volume).
- Platform for voluntary market underway.

VIETNAM:
- GOV Decree 06 (2022) mandates establishment of Compulsory Emission Trading System (ETS) in 2025.

THAILAND:
- Voluntary Emission Trading System (ETS) for targeted industries (petrochemical, cement, pulp & paper, iron & steel, refinery, glass, food, ceramic, textile)

MALAYSIA:
- Launched the Voluntary Carbon Market (VCM) known as the Bursa Carbon Exchange (BCX) in 2022/12.
- Partnership for Market Implementation (PMI) Readiness Support Plan (RSP) approved in 2022/08.
- Considering carbon pricing instruments (carbon tax, ETS).

INDONESIA:
- Considering carbon pricing/NEK (carbon tax of US$3-5/tCO2e and offset, emission trading system/ETC by 2025, carbon credit mechanism).

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Some Lessons Learned on Carbon Tax Policy

1

SIMPLE DESIGN
- A simple carbon tax design can increase revenue and reduce administrative burdens both for the government and for the businesses.

2

GRADUAL INTRODUCTION
- Introducing a carbon tax and gradually increasing it can increase revenue from industry and give businesses time to adapt. For example, some other countries take years for carbon taxes to be legally passed.
- UK: 1998-2001. Australia: 2008-2014. South Africa: 2006-2019. Canada:2015-2021. Colombia:2004-2017. South Korea: 2010 (transitional), 2015-(official start).

3

CLARITY ON CARBON VALUES
- The design of the carbon tax should provide clarity in terms of differentiated tax rates based on the carbon content for each type of fuel.
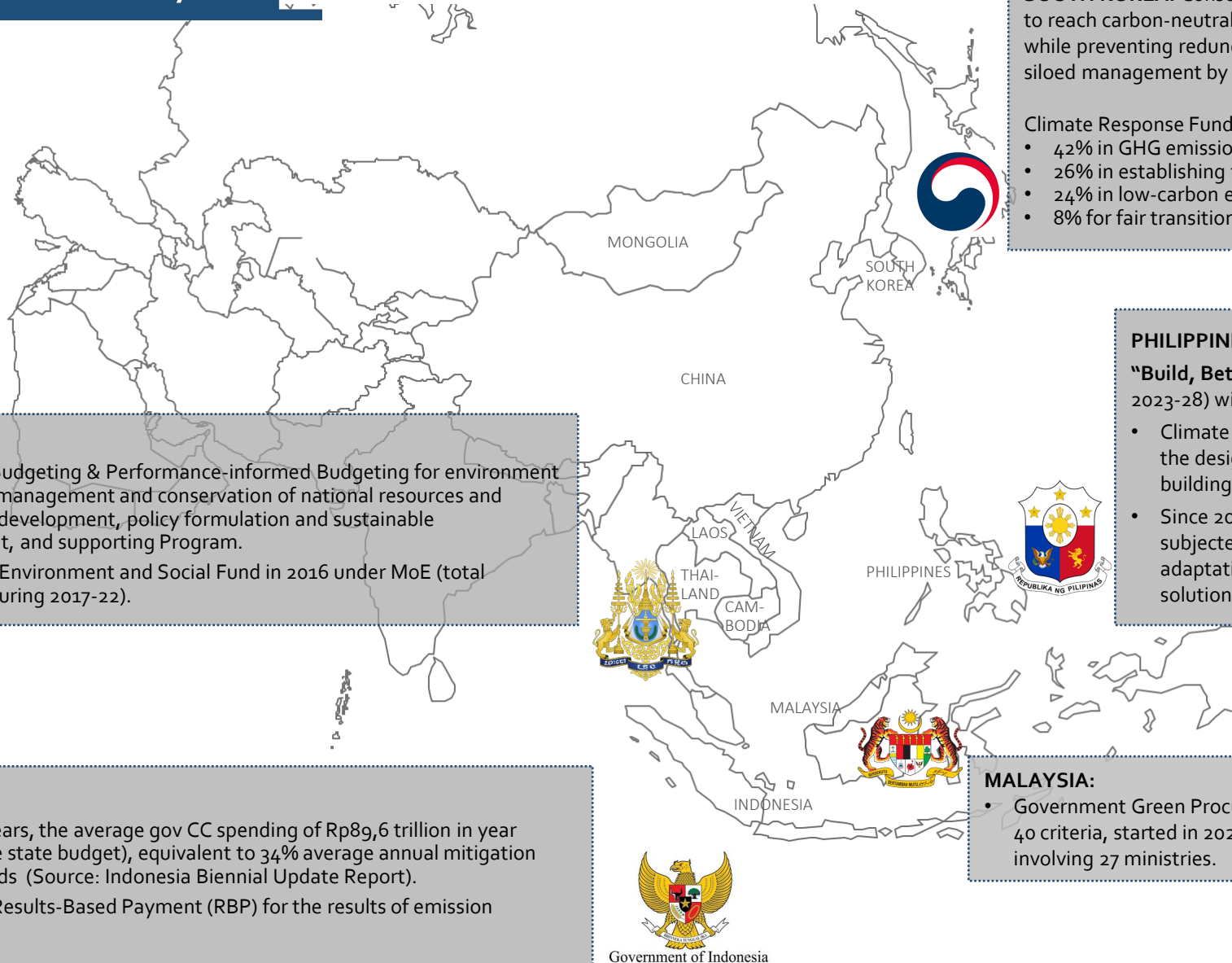
4

TARGETED UTILIZATION OF REVENUE FROM CARBON TAXES
- Utilization of revenue from carbon taxes for various policies in line with low-carbon development in a transparent and accountable manner is important to increase revenue and anticipate negative sentiment.

Expenditure Policy
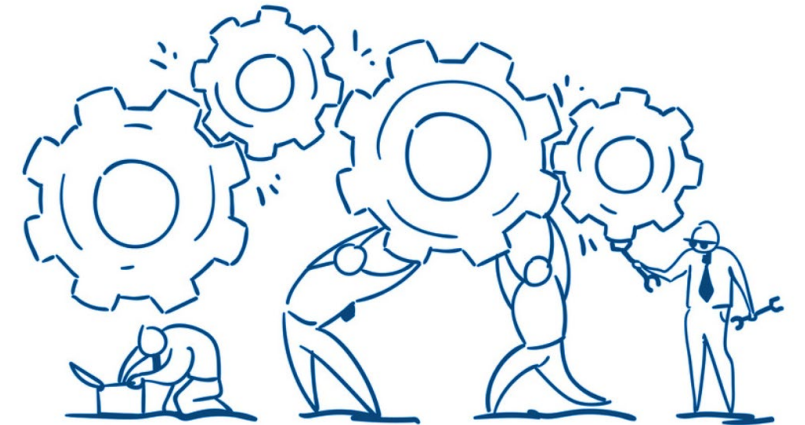
SOUTH KOREA: Consolidate climate projects into a single fund to reach carbon-neutral by 2050, to increase efficiency/synergy while preventing redundancy in climate projects due to separate, siloed management by different ministries.

Climate Response Fund (US$1.8B in 2022):
- 42% in GHG emission reduction,
- 26% in establishing foundational system,
- 24% in low-carbon ecosystem, and
- 8% for fair transition.

PHILIPPINES:

"Build, Better, More" Program (US$20B or about 5%-6% GDP for 2023-28) with Three-Year Rolling Infrastructure Program (TRIP):

- Climate data and risk assessment and green building standards in the design, construction, and renovation of government buildings/facilities.
- Since 2022, introduced climate-informed PIM (all gov. projects subjected to multi-scenario, probabilistic risk assessment, adaptation/mitigation planning). Promoted energy-saving solutions.

CAMBODIA:
- 4 Program Budgeting & Performance-informed Budgeting for environment protection, management and conservation of national resources and community development, policy formulation and sustainable development, and supporting Program.
- Established Environment and Social Fund in 2016 under MoE (total US$16.1M during 2017-22).

MALAYSIA:
- Government Green Procurement (GGP) takes into account 40 criteria, started in 2021. Valued at RM617M (US$140M), involving 27 ministries.

INDONESIA:
- In the last 5 years, the average gov CC spending of Rp89,6 trillion in year (3.9% from the state budget), equivalent to 34% average annual mitigation matching needs (Source: Indonesia Biennial Update Report).
- Considering Results-Based Payment (RBP) for the results of emission reductions.

Government of Indonesia

MONGOLIA

SOUTH KOREA

CHINA

VIETNAM

LAOS

THAI-LAND

CAM-BODIA

PHILIPPINES

REPUBLIKA NG PILIPINAS

MALAYSIA

INDONESIA

Green & Disaster Risk Financing

SOUTH KOREA: Green Bond Market is growing rapidly:
- New green bond issuance increased 5 times in 3 years, from 2018 to US$2.3B in 2021.
- Green finance instruments budget plan increased (green bond, green rate difference compensation, green guarantee, securitized bond), totally US$5.8B.

CHINA:
Innovations in market-based compensation methods, diversified sources, rather than relying solely on government financial investment:
- Credit risk compensation scheme (for key industries),
- Credit guarantee services (for green enterprise credit financing),
- National/Provincial Green Development Funds (e.g., soil pollution),
- Green PPPs (156 PPP projects in Hunan of US$13.2B);
- Pilot program for compensated use & trading of pollutant discharge rights (5,748 transactions by 2022-end, generating US$99.6M).

PHILIPPINES:
- Green bond: US$226M.
- Fiscal risks statement / Disaster Risk Financing and Insurance Strategy : (a) Market-based Instrument; (b) Contingent Financing; (c) Budgetary Instruments / Risk Resilience Program (PHP345B ~ US$6B) and 3 Funds NDRRMF of US$350M, LDRRMF of US$320M, QRF of 30%R). Policy/institutional measures: NDRRMP 2011-28, Disaster Risk Financing and Insurance (DRFI) Strategy.

THAILAND: Issued US$60M blue/green bond.

MALAYSIA:
- Launched 1st sovereign Sustainability Sukuk of US$800M in 2021/04. Oversubscribed 6.4 times across the world.
- 1st Domestic Malaysian Government Investment Issues (MGII) in 2022/09, of RM10B (~US$2.2B).

INDONESIA:
- The world's 1st Green Sukuk international issuing country, starting in 2018. Accumulated issuance of US$24B by 2022 (21% of all sovereign sukuk issuance of US$110B). Oversubscribed > 2 times. Pricing tightened by 30bp to 3.75%.
- Developed domestic Green Sukuk market since 2019 through the Green Sukuk Retail (Sukuk Tabungan) series, issued IDR 11.88trillion (US$820M) by now.
- Awarded as the largest issuer of Green Sukuk in the world in 2020 (Climate Bonds Initiative). 15 international awards from IFR Asia, Islamic Finance News, Finance Asia, Euromoney, The Asset Triple A, Climate Bond Initiative, and Cambridge IFA.
- Pre-issuance: climate budget tagging, framework development, project selection. Post-issuance: campaign/advocacy, impact reporting.

EAST TIMOR:
- Budget allocation to the National Authority of Civil Protection (NACP), Contingency Budget since 2020 (W&S, G&S, Capital).
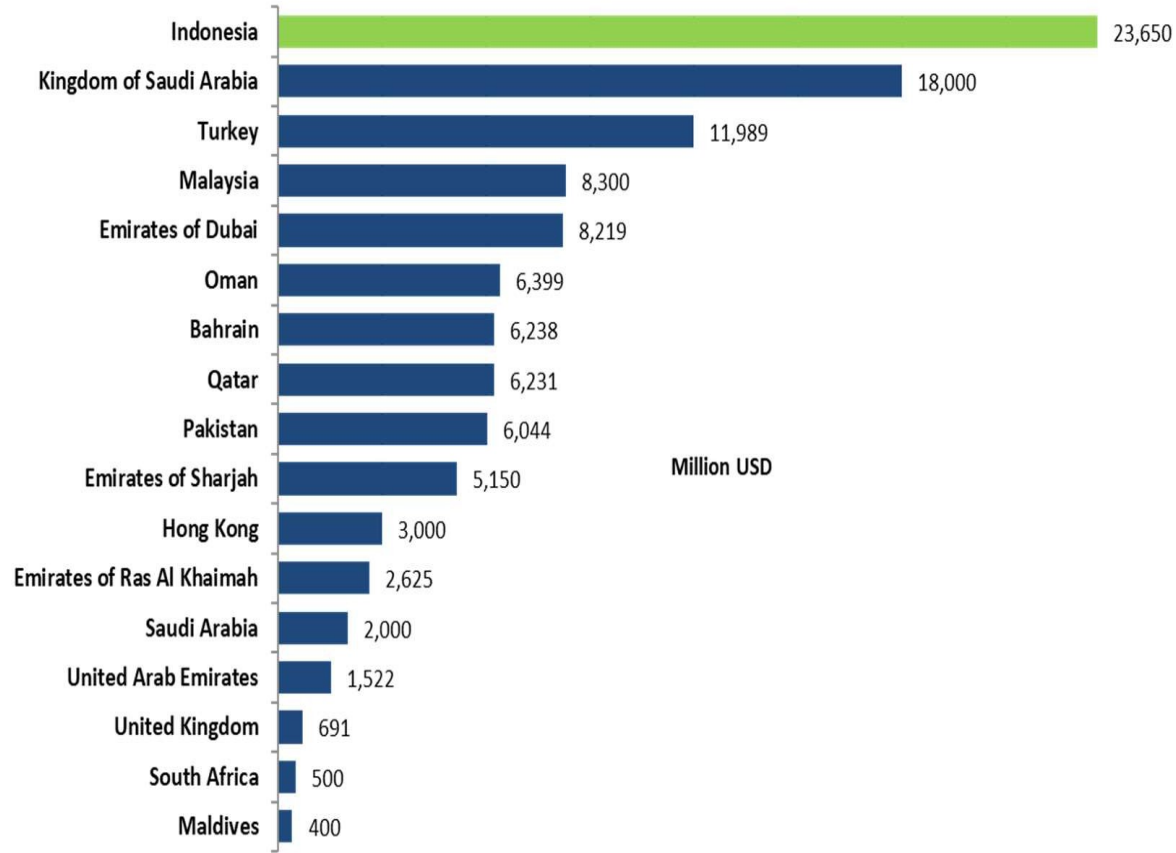
SOUTH KOREA

CHINA

PHILIPPINES

THAI-LAND

MALAYSIA

INDONESIA

EST TIMOR

Government of Indonesia

International Sovereign Sukuk Issuance

| Country	Million USD
Indonesia	23,650
Kingdom of Saudi Arabia	18,000
Turkey	11,989
Malaysia	8,300
Emirates of Dubai	8,219
Oman	6,399
Bahrain	6,238
Qatar	6,231
Pakistan	6,044
Emirates of Sharjah	5,150
Hong Kong	3,000
Emirates of Ras Al Khaimah	2,625
Saudi Arabia	2,000
United Arab Emirates	1,522
United Kingdom	691
South Africa	500
Maldives	400

Climate Bonds Taxonomy

The Climate Bonds Taxonomy identifies the assets and projects needed to deliver a low carbon economy and gives GHG emissions screening criteria consistent with the 2-degree global warming target set by the COP 21 Paris Agreement. More information is available at https://www.climatebonds.net/standard/taxonomy.

CLIMATE BONDS STANDARD CERTIFIED

ENERGY	TRANSPORT	WATER	BUILDINGS	LAND USE & MARINE RESOURCES	INDUSTRY	WASTE	ICT
Solar	Private transport	Water monitoring	Residential	Agriculture	Cement production	Preparation	Broadband networks
Wind	Public passenger transport	Water storage	Commercial	Commercial Forestry	Steel, iron & aluminium production	Reuse	Telecommuting software and service
Geothermal	Freight rail	Water treatment	Products & systems for efficiency	Ecosystem conservation & restoration	Glass production	Recycling	Data hubs
Bioenergy	Aviation	Water distribution	Urban development	Fisheries & aquaculture	Chemical production	Biological treatment	Power management
Hydropower	Water-borne	Flood defence		Supply chain management	Fuel production	Waste to energy	
Marine Renewables		Nature-based solutions				Landfill	
Transmission & distribution						Radioactive waste management	
Storage							
Nuclear							

Certification Criteria approved
Criteria under development
Due to commence

10/2020
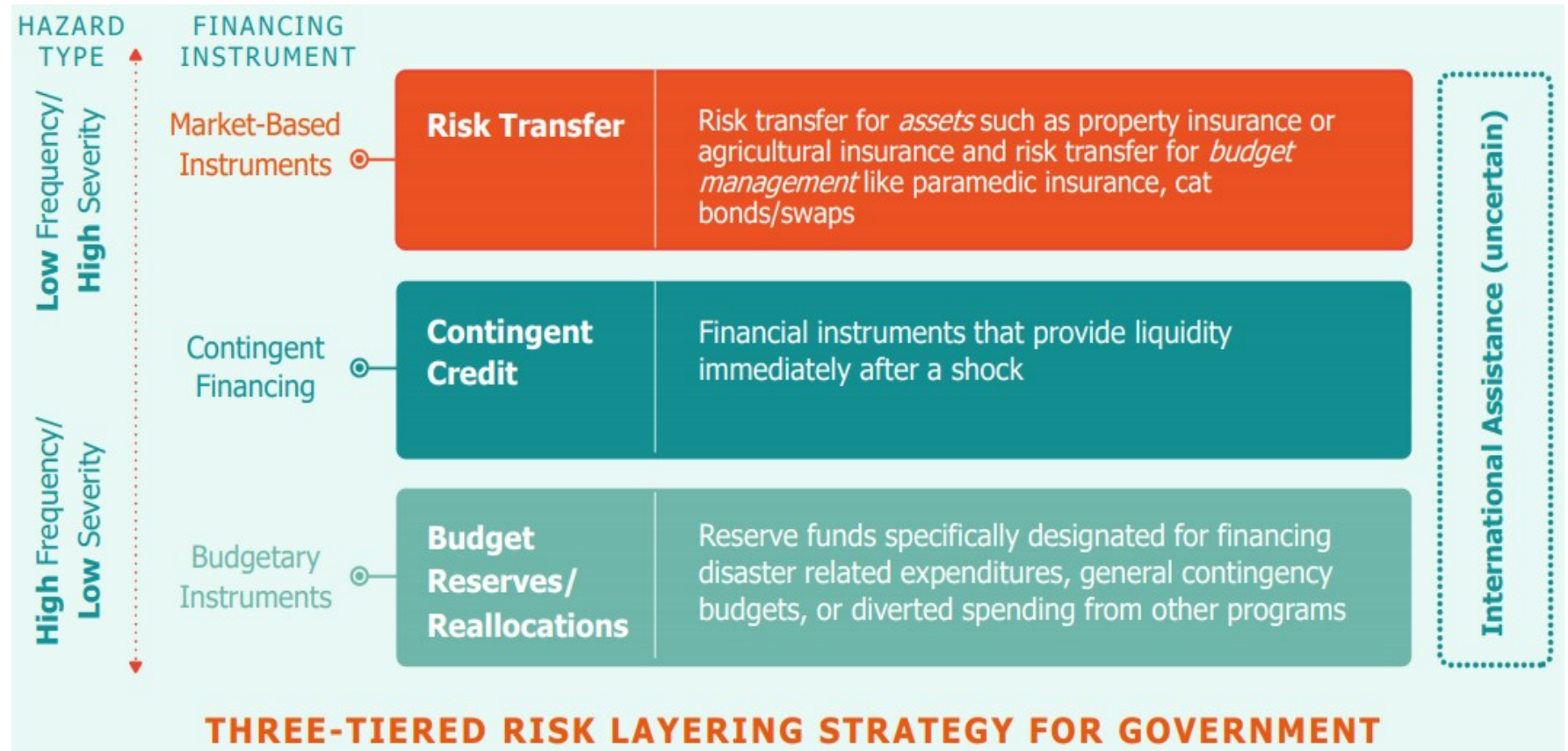
ECOLOGICAL INTERGOVERNMENTAL FISCAL TRANSFERS

1. **Payments for ecosystem services (PES):** transfers resources to private or communal landowners and SNGs.
2. **Ecological fiscal transfers (EFTs):** used as an intergovernmental transfer scheme by governments to distribute a pool of resources.
3. **Payments for reducing emissions from deforestation and forest degradation (REDD+)** plus conservation, sustainable management of forests, and enhancing forest carbon stocks: an international development tool to help low-income countries to protect forests.

PORTUGAL

- The size of protected areas affects the allocation of funds from the General Municipal Fund, effectively constituting an ecological fiscal transfer. Of the amount transferred, 30% is distributed according to the area of the municipality and the area designated as a conservation zone.

FRANCE

- In the 2006 reform of its intergovernmental transfer system, France introduced an "ecological allocation" for municipalities in which national parks or marine parks are located.

INDONESIA

- Fiscal incentives (DID) (~$650-950M/year) for 15 categories.
- Ecological category = EFT (TAPE/TAKE) scheme introduced in 2020 in North Kalimantan province, by 2022 adopted in 10 districts (~US$4.5M in 2022) and socialized to more than 40 subnational governments.
- Specific Allocation Fund (DAK) (~US$45-50M).

BRAZIL

- 5% of VAT revenue was distributed among municipalities according to the location of protected areas. In the state of Paraná, 5% of the municipal share (25% of GST/VAT revenue) is distributed according to ecological considerations (half to conservation units and half to watershed protection). These criteria include the size of protected areas, the area of the municipality and the protected area's management category. Some states also impose additional environmental criteria, such as protection of water reserves, quality of water, sanitation and treatment of solid waste and sewage.
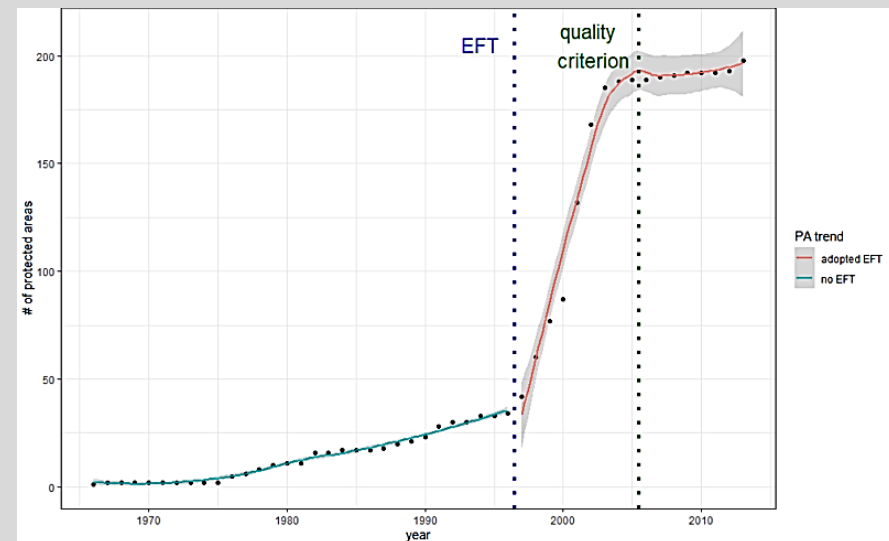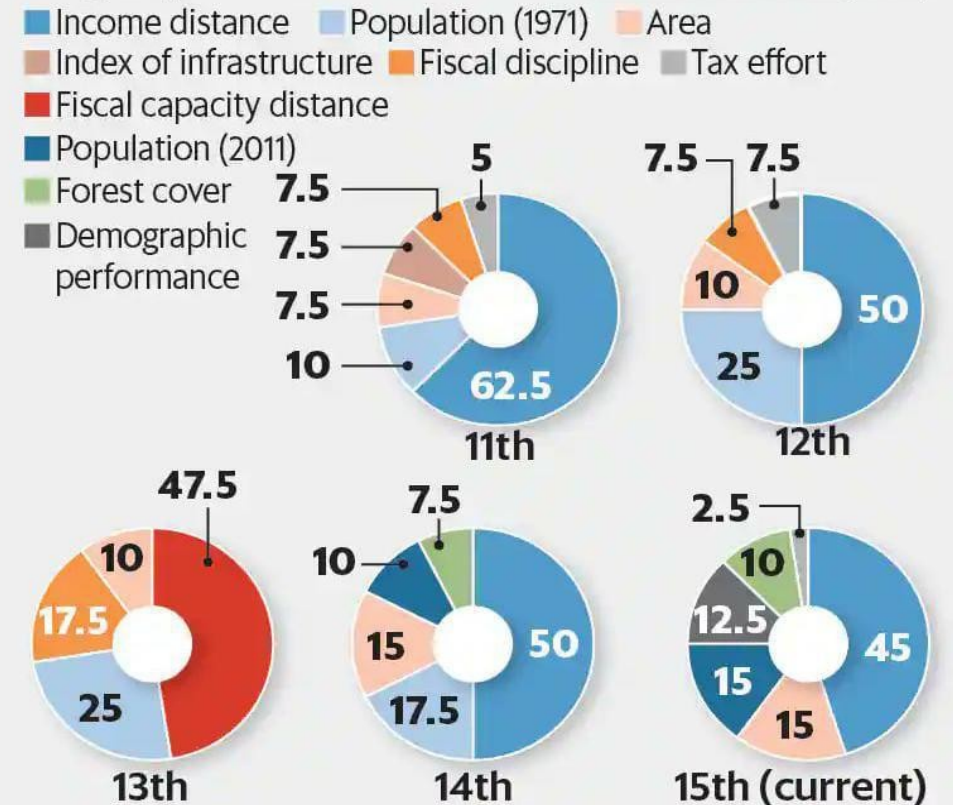

- *Figure:* Development of protected areas in the Brazilian state of Minas Gerais before and after the adoption of Ecological Fiscal Transfers (EFT). Dashed lines indicate the introduction of EFT in 1996 and the protected area management criterion in 2005 which changed the incentive structures from quantity to quality of protected areas. *Source:* Adapted from de Paulo & Camões (2019).

- **World's largest ecological fiscal transfer (EFT)** system; amounts to providing states **US$ 7.4 billion** a year based on forest cover b/w 2015/16 and 2018/19 (14th Finance Commission /FC).

- The scale of the annual funding of India's EFT dwarfs the US$1 billion available as annual international funding for REDD+.

- Many times, larger than the **incentive-based grant** for forest cover under the 13th FC, around **US$5 billion** over a period of five years.

- 15th FC went beyond **forest and included some part of ecology** with increase in weight from 7.5% to 10%.

- Both a forward-looking incentive and a reward for past performance for maintaining the forest.

- Accordingly, States increased their budgets for forestry by 19% in absolute terms in the three years after the introduction of EFTs (*Jonah Busch et al 2020*).

What finance commissions considered to determine what each state receives

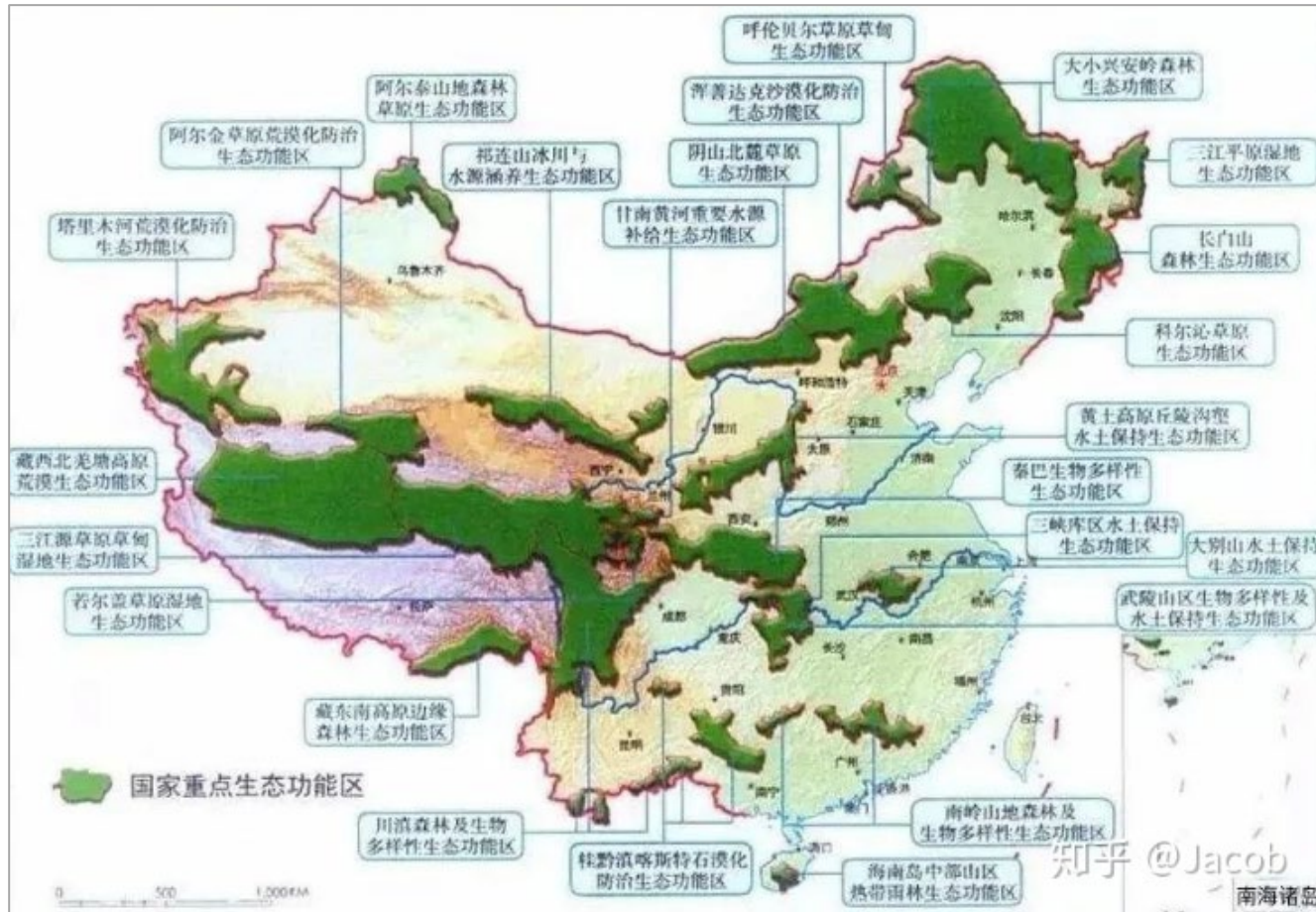**Weightage under different finance commissions** (in %)

Income distance   Population (1971)   Area
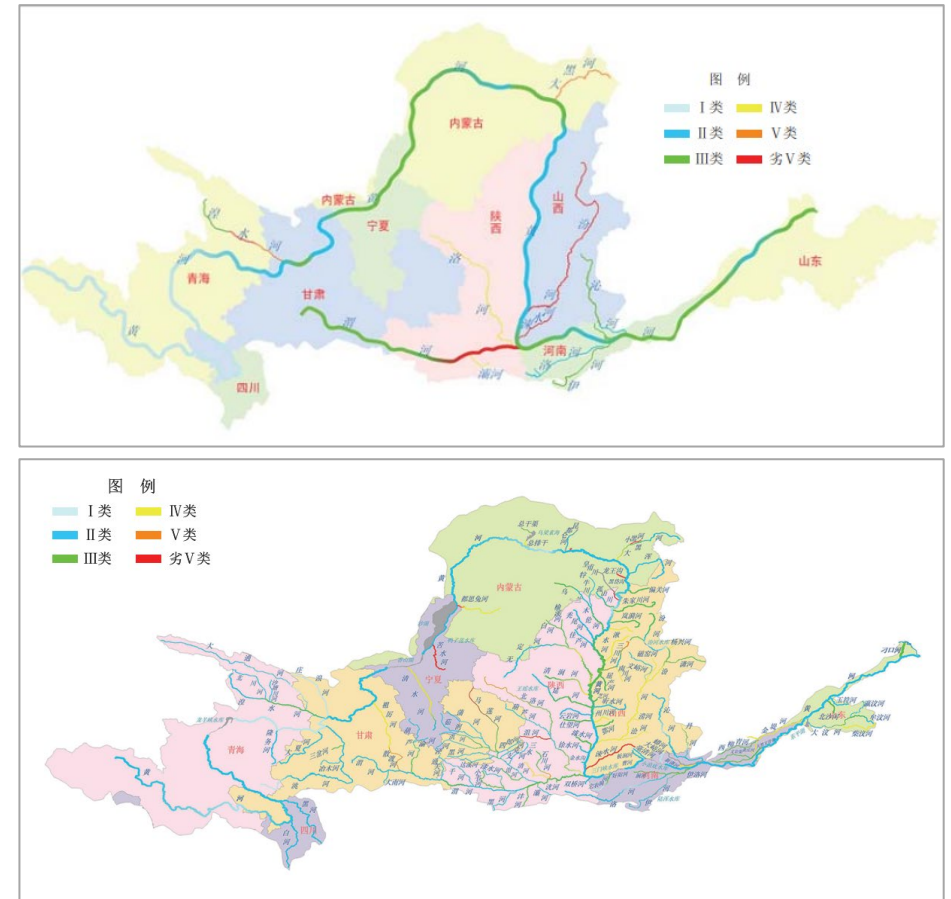Index of infrastructure   Fiscal discipline   Tax effort
Fiscal capacity distance
Population (2011)
Forest cover
Demographic performance

11th: 7.5, 5, 7.5, 7.5, 10, 62.5
12th: 7.5, 7.5, 10, 25, 50
13th: 47.5, 10, 17.5, 25
14th: 7.5, 10, 15, 17.5, 50
15th (current): 2.5, 10, 12.5, 15, 15, 45

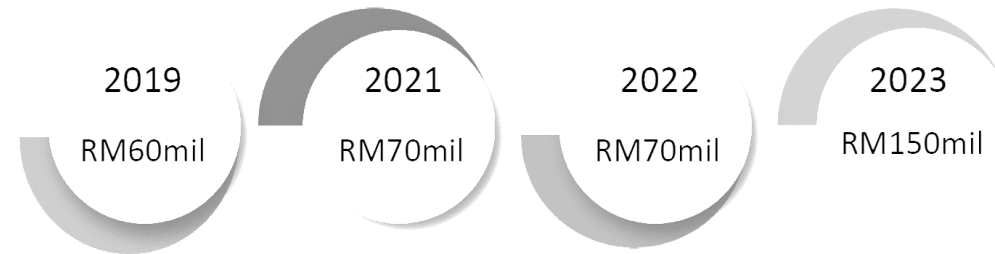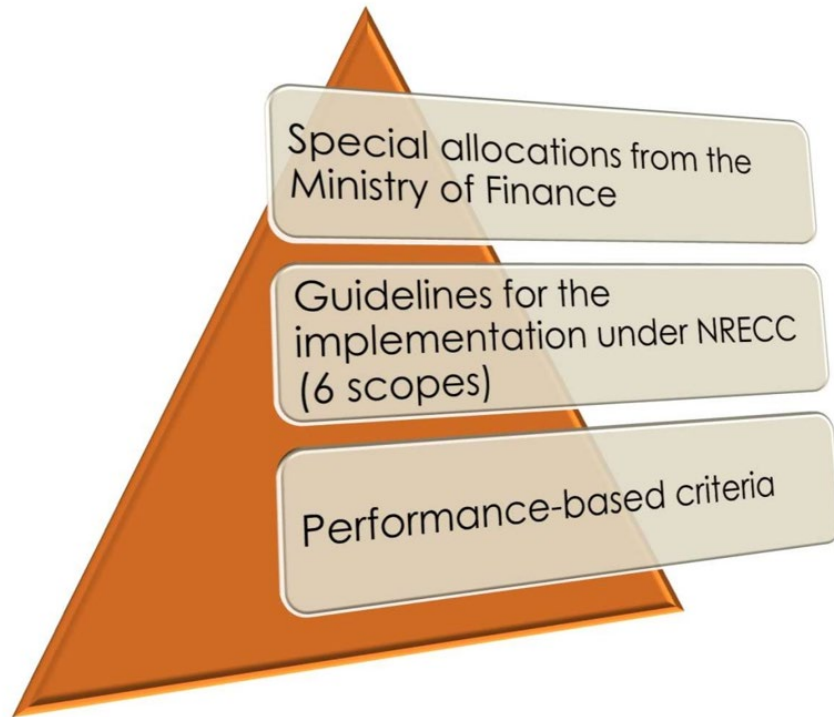## Vertical Payment for Ecological Services (PES) in China

Horizontal Payment for Ecological Services (PES) in China

Source: China Ministry of Ecology and Environment

Monitoring the impact is at the heart of PES schemes, with 3 important issues: **conditionality**, **additionality**, and **leakage**.

Special allocations from the Ministry of Finance

Guidelines for the implementation under NRECC (6 scopes)

Performance-based criteria

2019
RM60mil

2021
RM70mil

2022
RM70mil

2023
RM150mil

EFT Distribution Formula:

Threshold value   +   Size of protected areas   +   Performance-based criteria

RM 200,000 $70\% \left(\dfrac{\text{Area of State's PA}}{\text{Area of Overall land}} \right)$ $30\% \left(\dfrac{\text{Area of State's PA}}{\text{Area of State's land}} \right)$
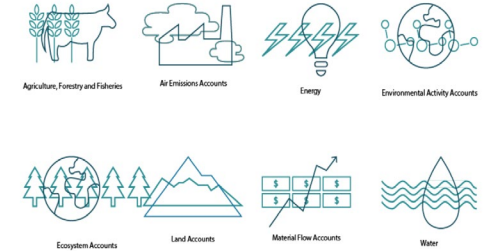
Natural Capital Accounting

Countries that have compiled SEEA(System of Environmental-Economic Accounting) – EEA (Experimental Ecosystem Accounting) accounts

Type of ecosystem accounts compiled
- National
- National and subnational
- Subnational

Natural Capital Accounting (NCA)

- Measure and report on **physical (stocks & flows)** and **financial (values)** of natural capital.
- Account for individual environmental assets or resources, both biotic and abiotic (such as water, minerals, energy, timber, fish), as well as for ecosystem assets (e.g., forests, wetlands), biodiversity and ecosystem services.

System of Environmental Economic Accounting

- **Environmental & economic information & relationship** presented in an internationally agreed set of standard concepts, definitions, classifications, accounting rules & tables to produce internationally comparable statistics.
- Good for compiling integrated indicators to **assess trade-offs** & **improve management of scare capital**.
- Links to System of National Accounts (SNA) by using same classifications & methods.
- Already used in **54 countries**.

Thank you.

Quyen Hoang Vu | World Bank Senior Governance Specialist / PEMNA Team Leader

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PEMNA Website |
https://www.pemna.org/eng/index.do

10th Anniversary Promotional Video |
https://www.pemna.org/bbs/Publications_PEMNAVideos_Meetings/view.do?
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