Third Meeting of the SCS SAP Regional Scientific and Technical Committee (RSTC-3)

SUPPORTED BY: gef

LED BY: UN environment programme

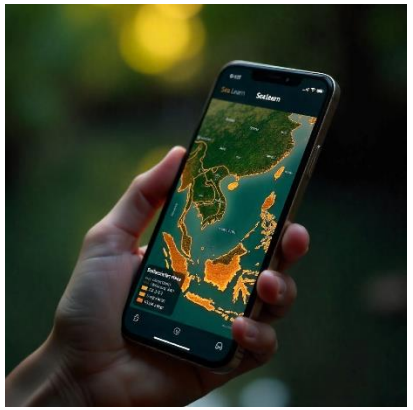
IN PARTNERSHIP WITH: UNOPS

RSTC3 Meeting
26-28 Jan 2026
Phú Quốc

Regional TDA:

Why an update now?

By: Liana Talaue McManus



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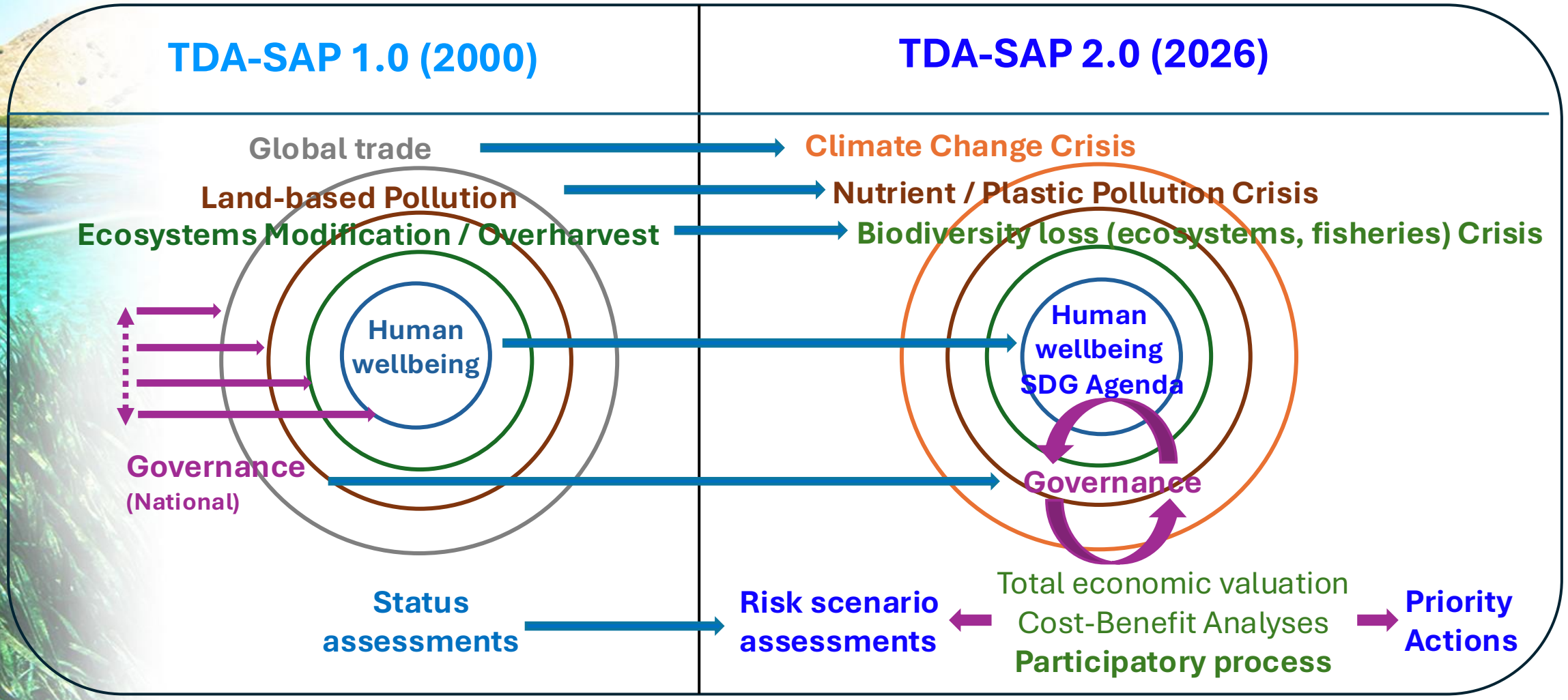
2000:
International Trade
Population Growth
Weak governance capacity

2025:
Climate change
Biodiversity loss
Pollution (Nutrients, Plastics)

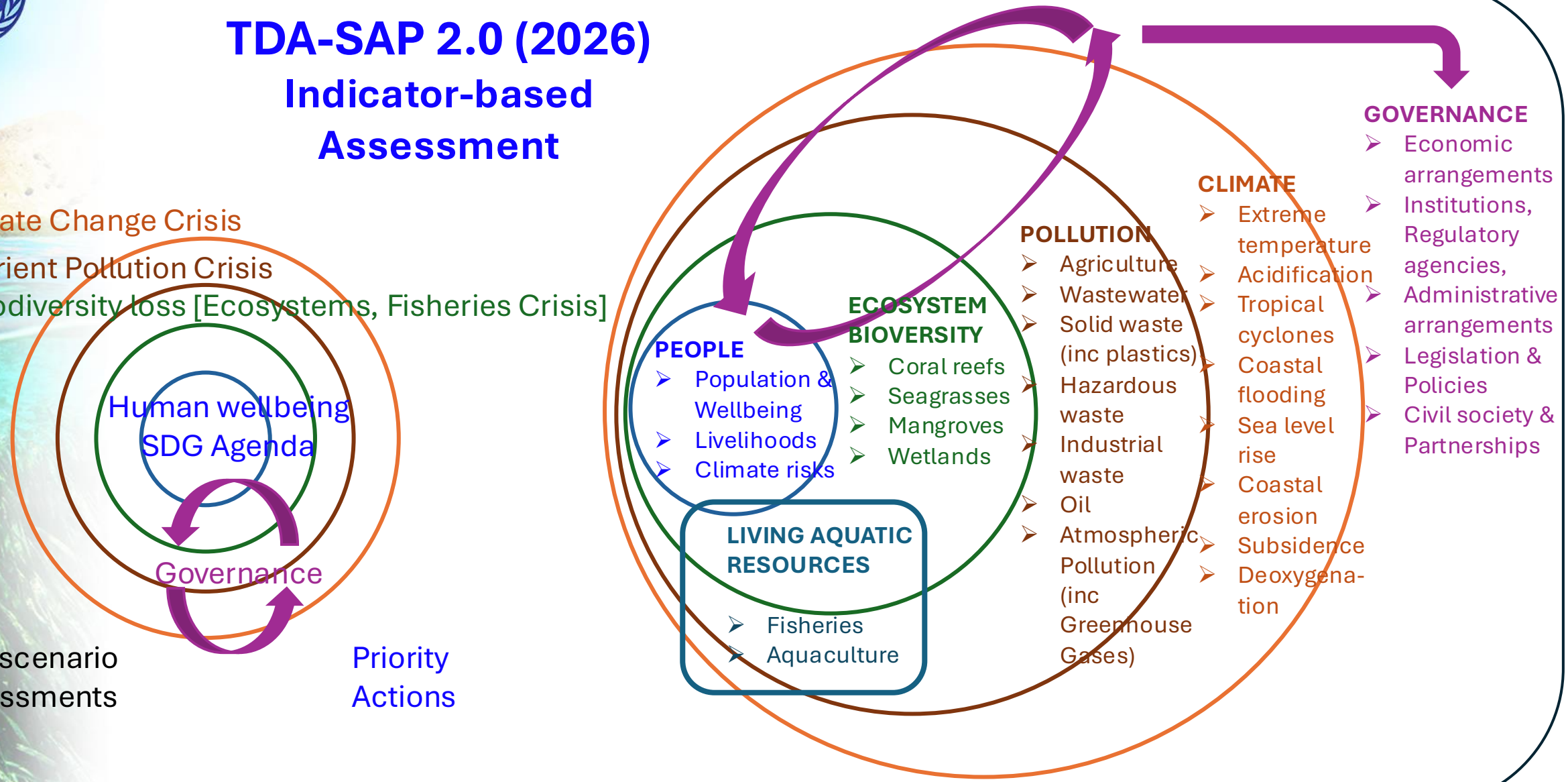
Lessons learned from SCS SAPs

Transboundary Diagnostic Analysis (TDA)	**What are transboundary and shared national environmental problems?**
Strategic Action Programme (SAP)	• What can be done to solve or mitigate these? • How best can actions be implemented? • What are the net benefits, including costs of inaction?

TDA-SAP Update (National, LME scales): From Status to Risk Scenario Assessments

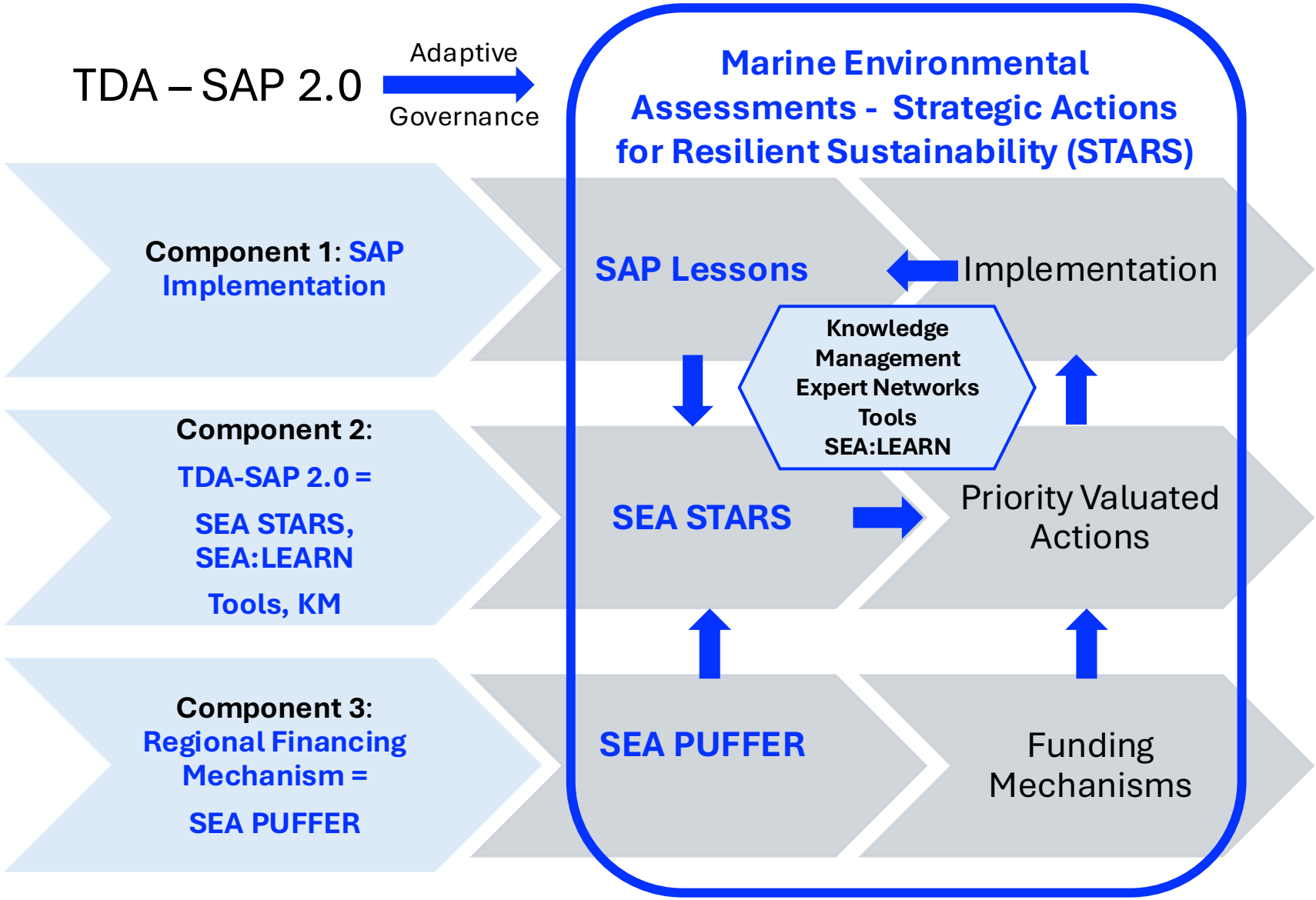


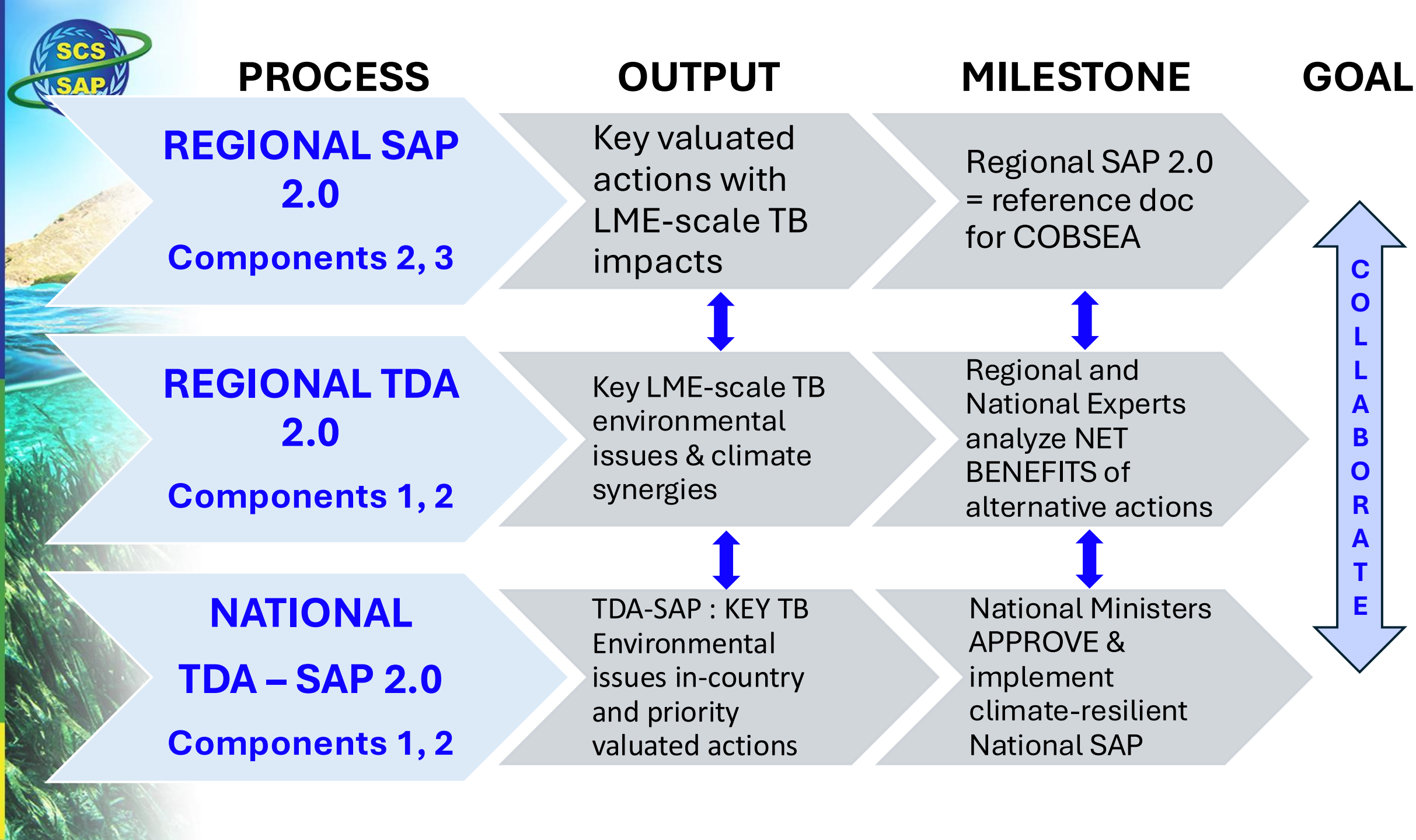
TDA-SAP 2.0 (2026)
Indicator-based Assessment



Identifying Key Component Deliverables

[*SCS SAP Project Retreat, October 2024*]




PROCESS
OUTPUT
MILESTONE
GOAL
REGIONAL SAP 2.0
Components 2, 3
Key valuated actions with LME-scale TB impacts
Regional SAP 2.0 = reference doc for COBSEA
REGIONAL TDA 2.0
Components 1, 2
Key LME-scale TB environmental issues & climate synergies
Regional and National Experts analyze NET BENEFITS of alternative actions
NATIONAL TDA – SAP 2.0
Components 1, 2
TDA-SAP : KEY TB Environmental issues in-country and priority valuated actions
National Ministers APPROVE & implement climate-resilient National SAP
COLLABORATE

MILESTONES

Spatial Scale	TDA Reports	STARS Report
COBSEA STARS	Regional & National TDA Infographics **May 2026**	**Regional & National STARS** Infographics **Jun 2026**
Regional TDA-SAP	Regional TDA Report **Jun 2025 – Feb 2026**	**For IGM-reference Regional STARS Report** **Mar-Jun 2026**
National TDA-SAP	TDA Report **Feb-Feb 2025**	**Govt- Approved NAT STARS Report** **Nov 2025 – May 2026**

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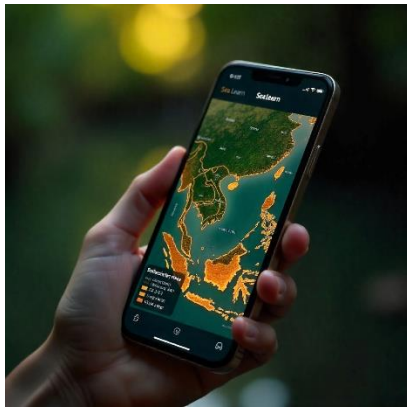
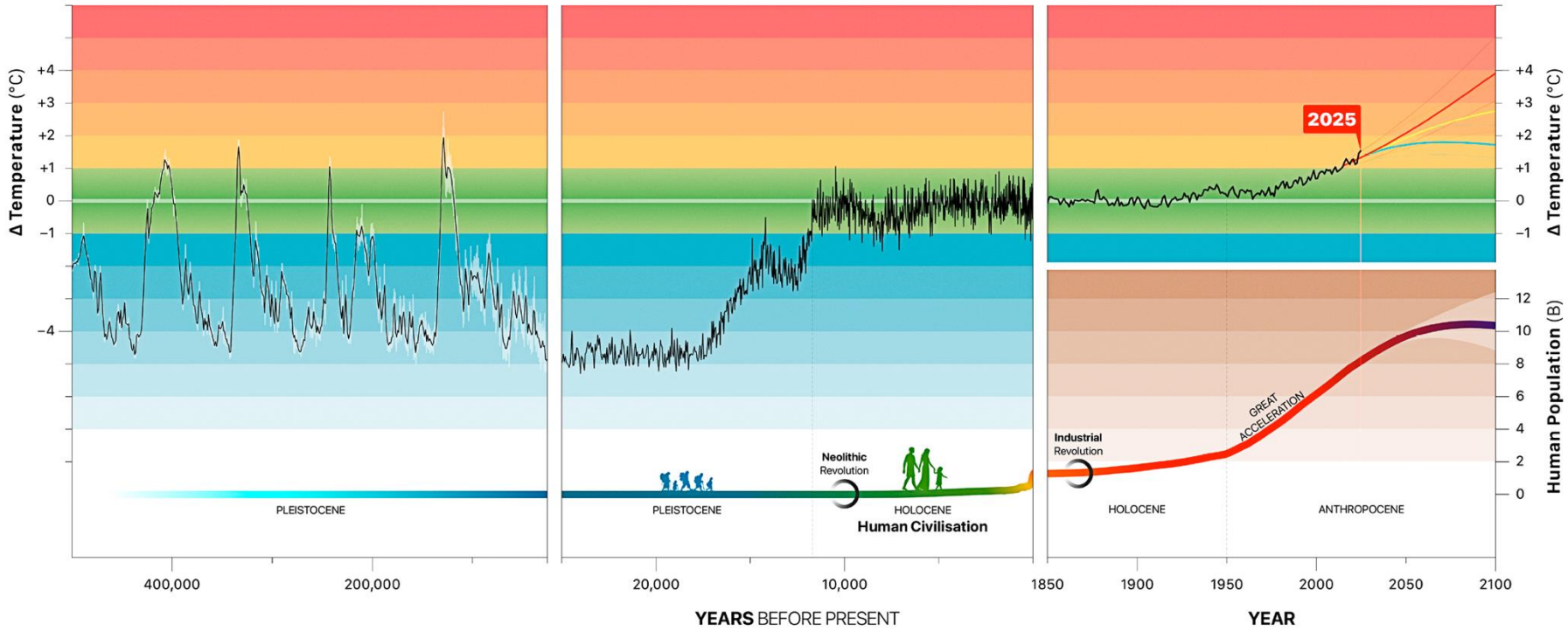
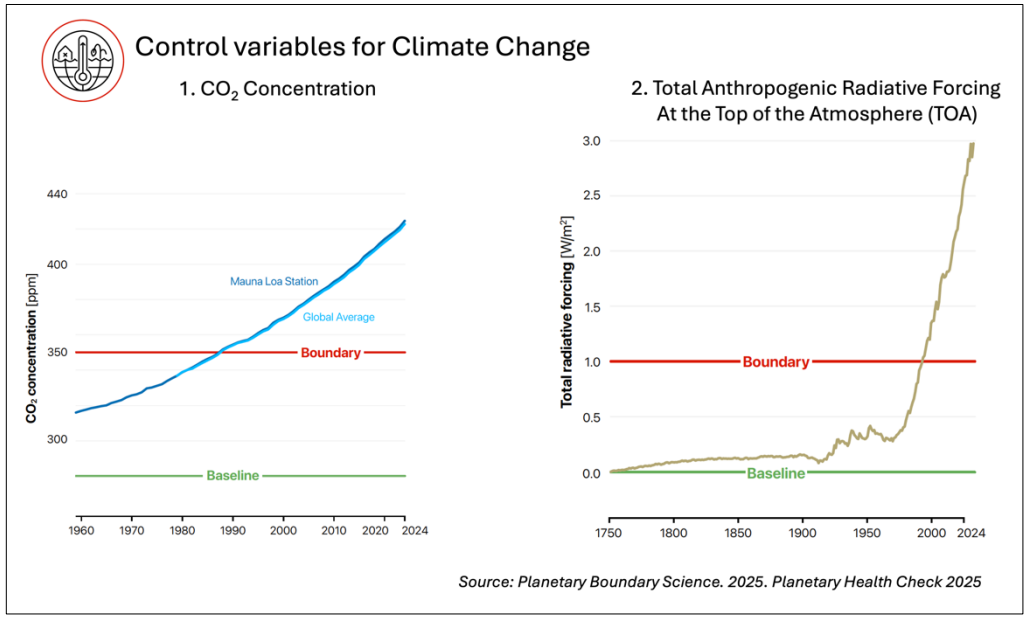
Regional TDA:

How is climate change manifested in the SCS-GoT?

By: Liana Talaue McManus







Climate Change:

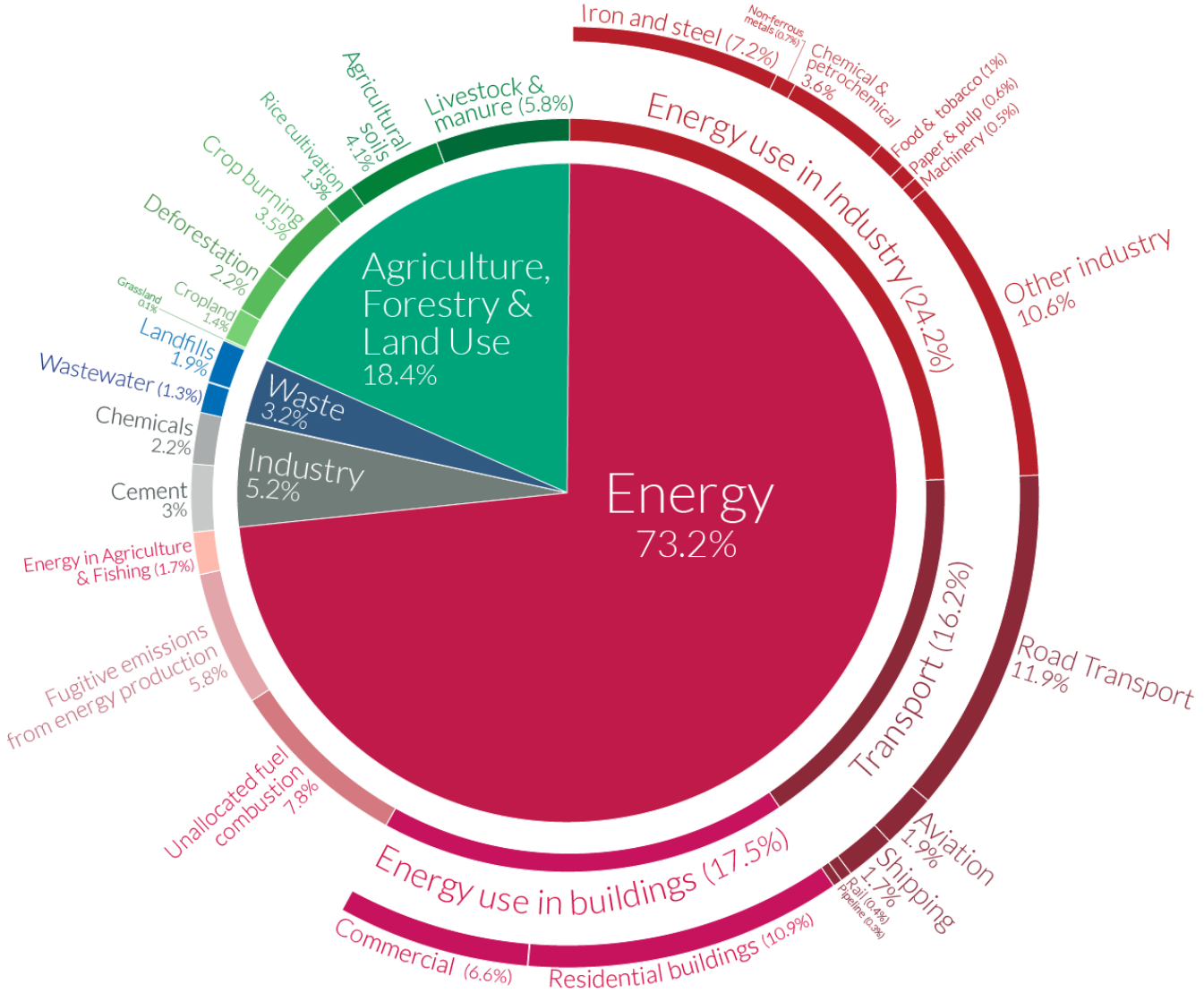
1. CO_2 Concentration increases beyond safe limits

2. Radiative forcing exceeds safe limits

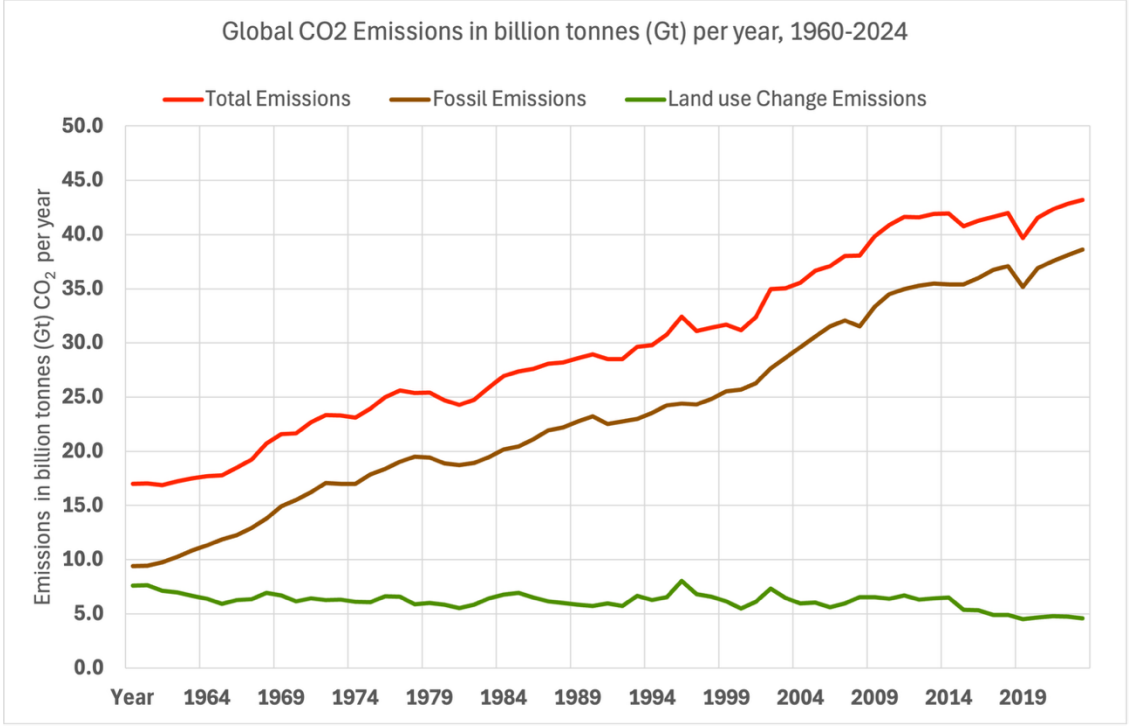
Global greenhouse gas emissions by sector

This is shown for the year 2016 – global greenhouse gas emissions were 49.4 billion tonnes CO_2eq.

Our World in Data



OurWorldinData.org – Research and data to make progress against the world's largest problems.
Source: Climate Watch, the World Resources Institute (2020).



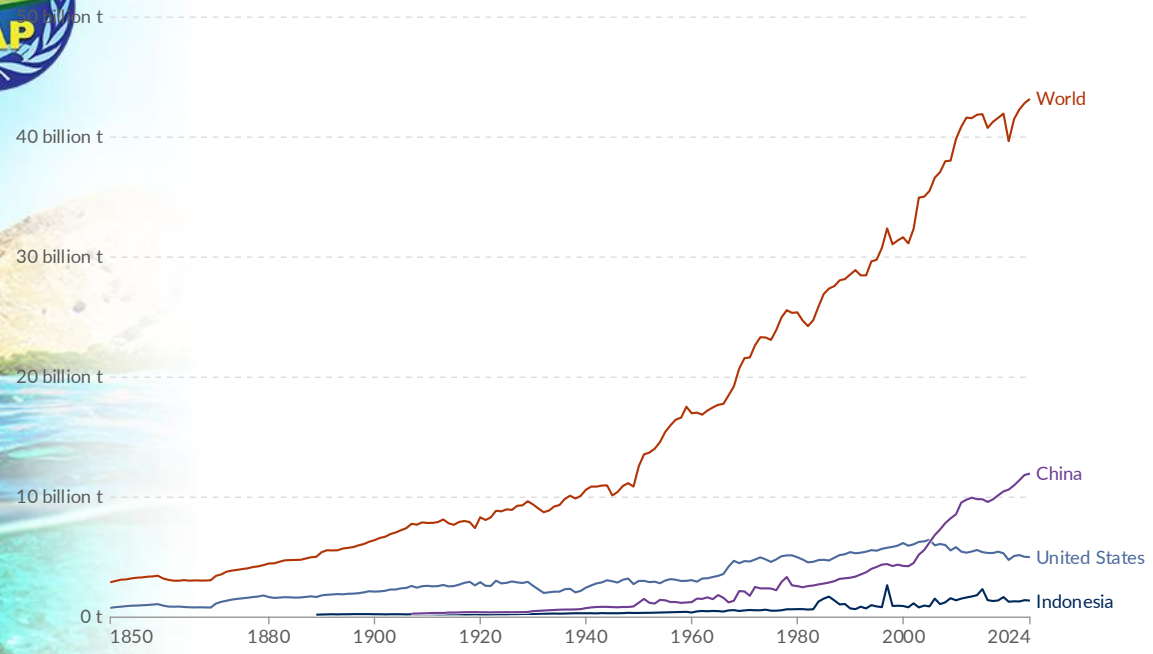
Greenhouse gas emissions (global):

1. Fossil fuel-based energy use (industry, buildings, transport)
2. Food production
3. Manufacture of cement and chemicals
4. Wastewater and Landfills

Annual CO_2 emissions including land-use change, 1850 to 2024

Our World in Data

Emissions include those from fossil fuels and industry[1], and land-use change[2]. They are measured in tonnes.



Data source: Global Carbon Budget (2025)

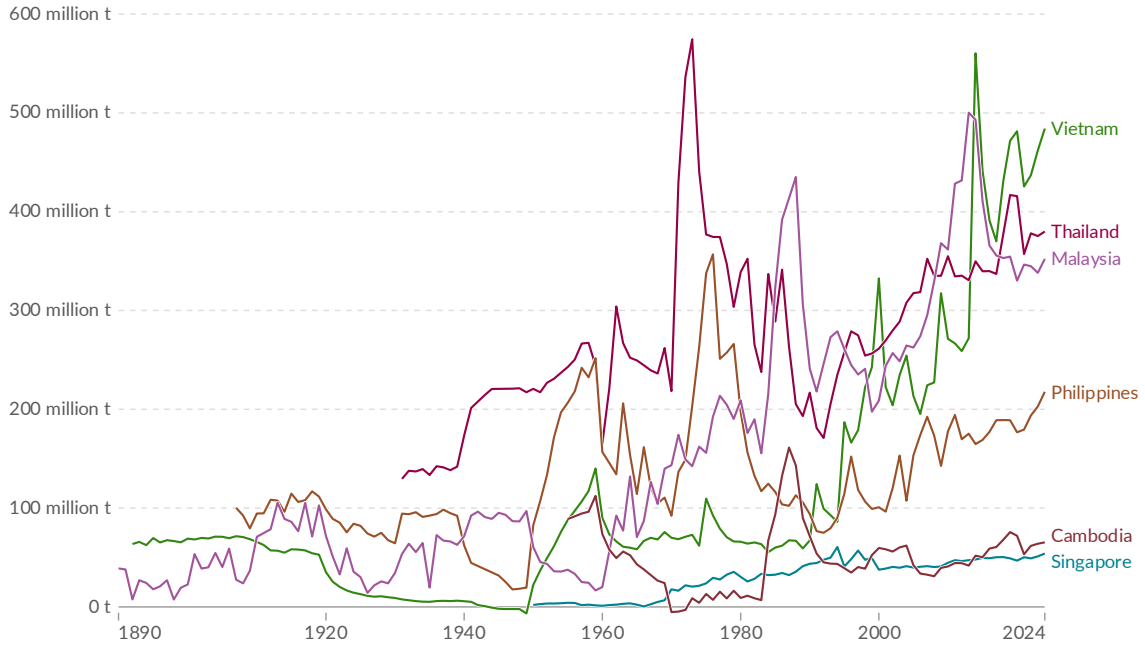
OurWorldinData.org/co2-and-greenhouse-gas-emissions | CC BY

Note: Emissions from land-use change can be positive or negative depending on whether carbon is emitted or sequestered.

Annual CO_2 emissions including land-use change, 1890 to 2024

Our World in Data

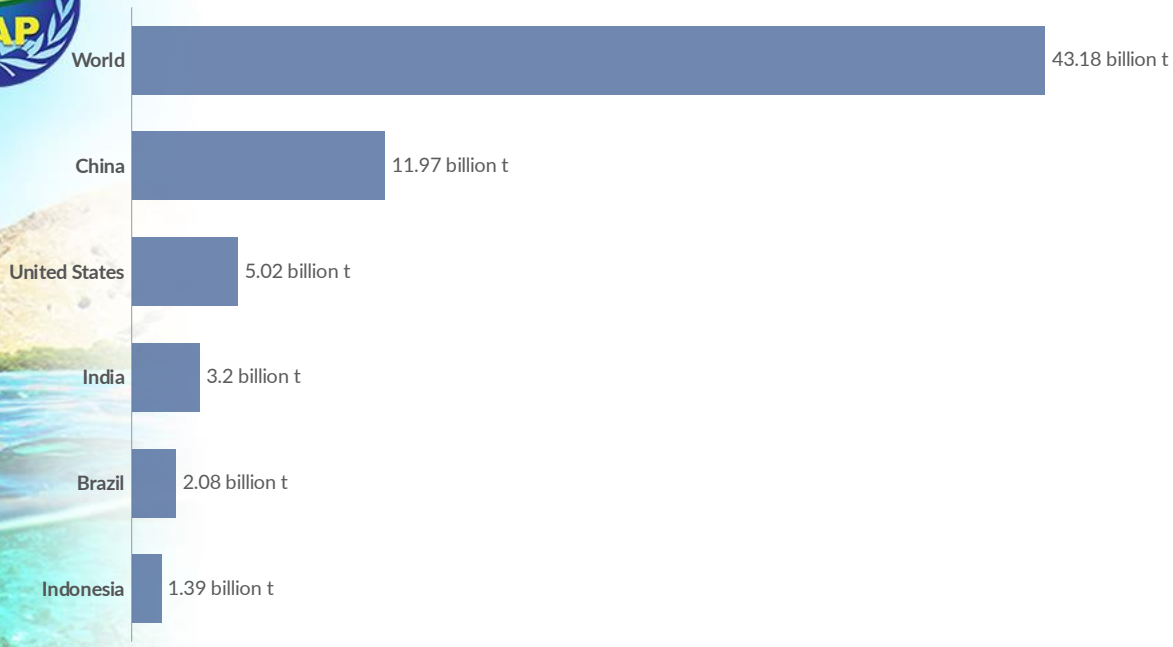
Emissions include those from fossil fuels and industry[1], and land-use change[2]. They are measured in tonnes.

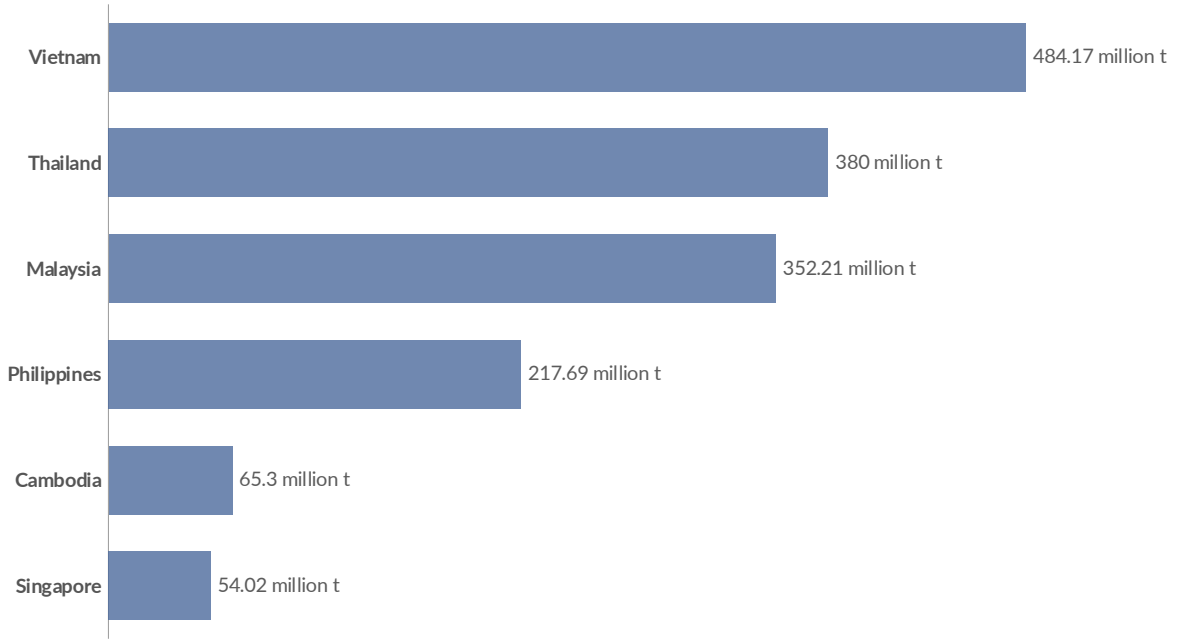


Data source: Global Carbon Budget (2025)

OurWorldinData.org/co2-and-greenhouse-gas-emissions | CC BY

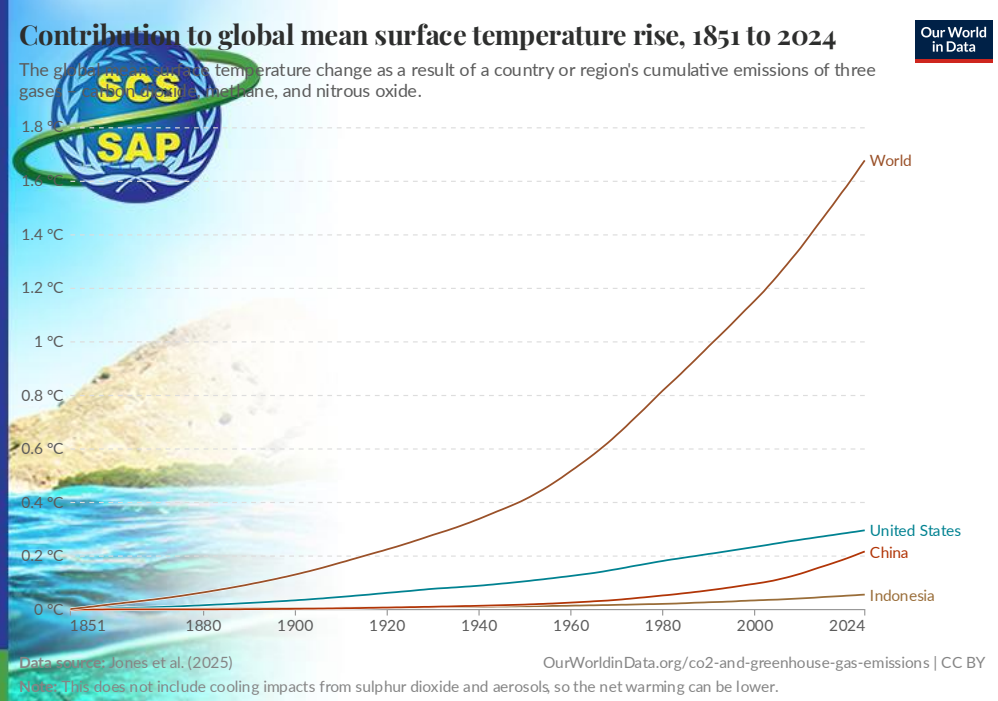
Note: Emissions from land-use change can be positive or negative depending on whether carbon is emitted or sequestered.

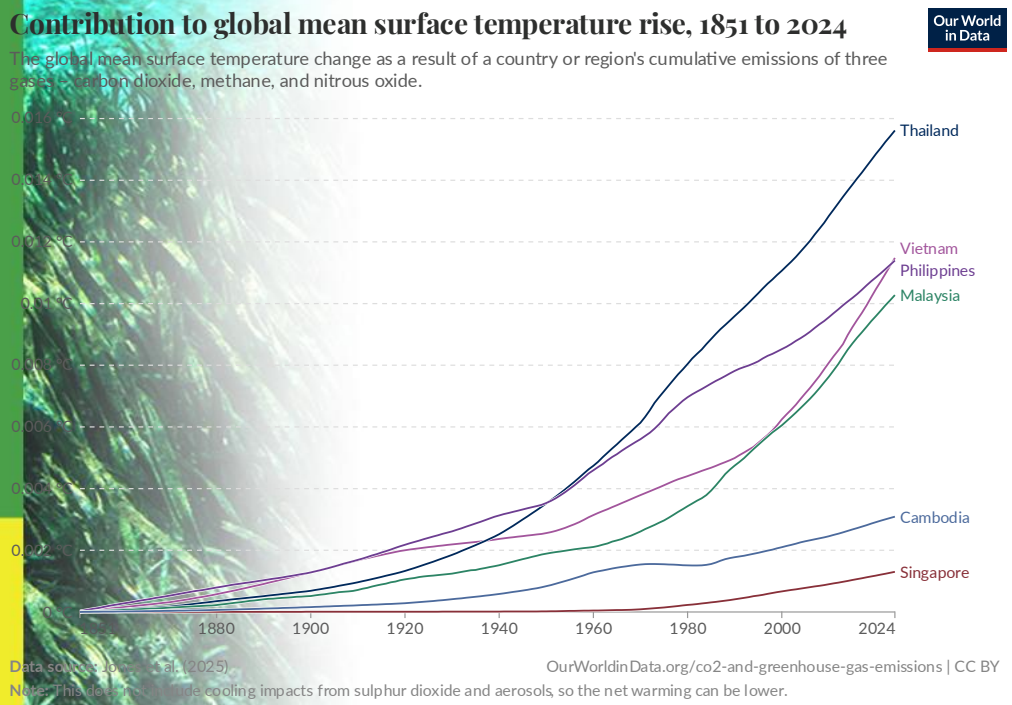




In 2024:

1. Maritime SCS-GoT countries contributed 7% of global greenhouse gas emissions.
2. China contributed 28% of global greenhouse gas emissions
3. All SCS-GoT countries contributed 35% of global greenhouse gas emissions, inclusive of land use change sources

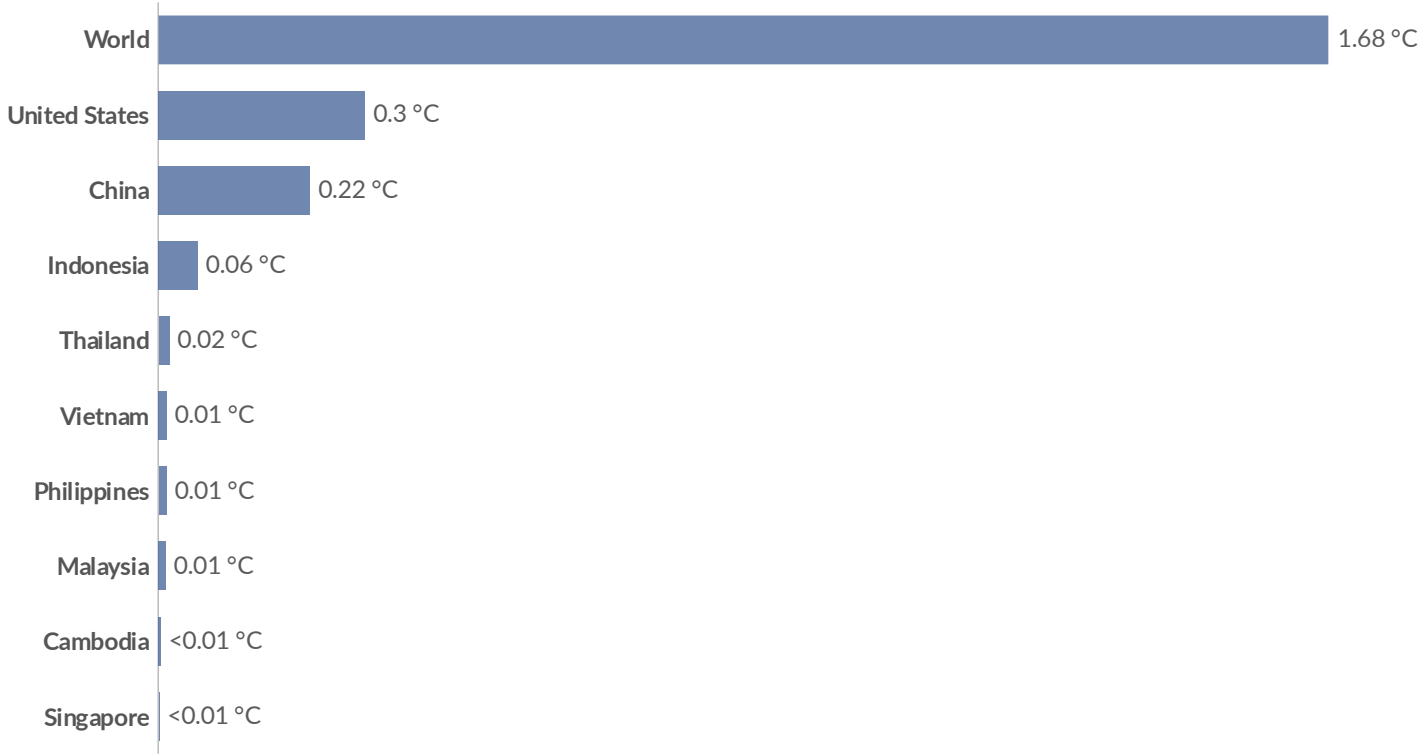




Contribution to global mean surface temperature rise, 2024

Our World in Data

The global mean surface temperature change as a result of a country or region's cumulative emissions of three gases – carbon dioxide, methane, and nitrous oxide.

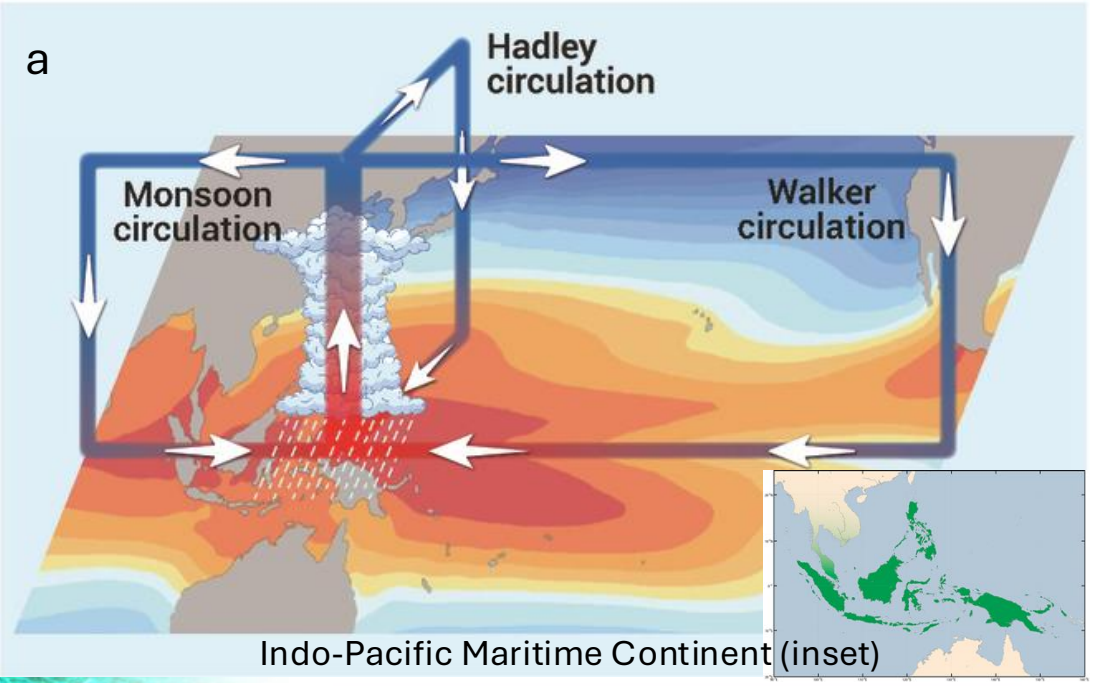


Data source: Jones et al. (2025) OurWorldinData.org/co2-and-greenhouse-gas-emissions | CC BY

Note: This does not include cooling impacts from sulphur dioxide and aerosols, so the net warming can be lower.

In 2024, SCS-GoT coastal states contributed 0.35◦C out of the global 1.68 ◦C (20%). Of these, China contributed 13%, Indonesia, 3.5%, and all other remaining six countries accounted for the remaining 3.5%.

a



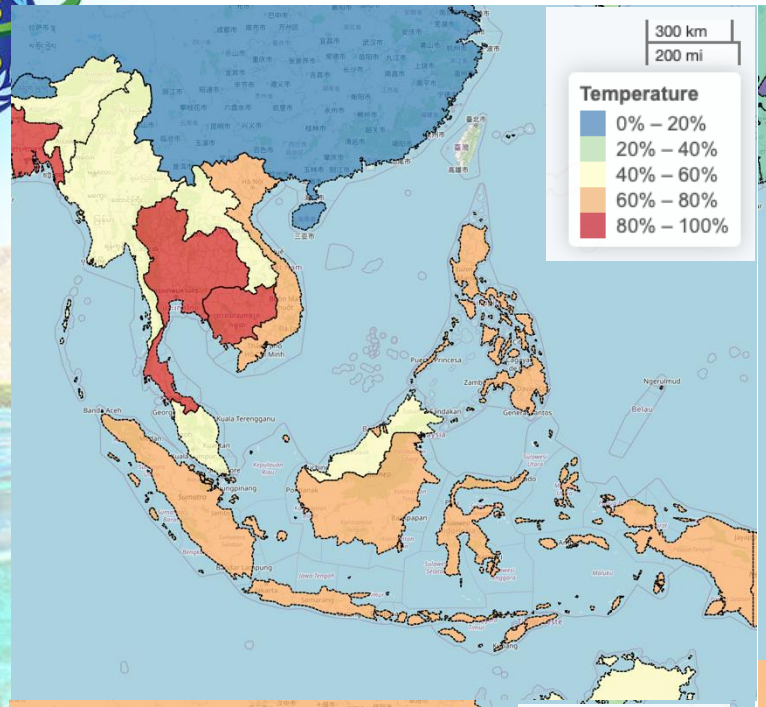
Indo-Pacific Maritime Continent (inset)

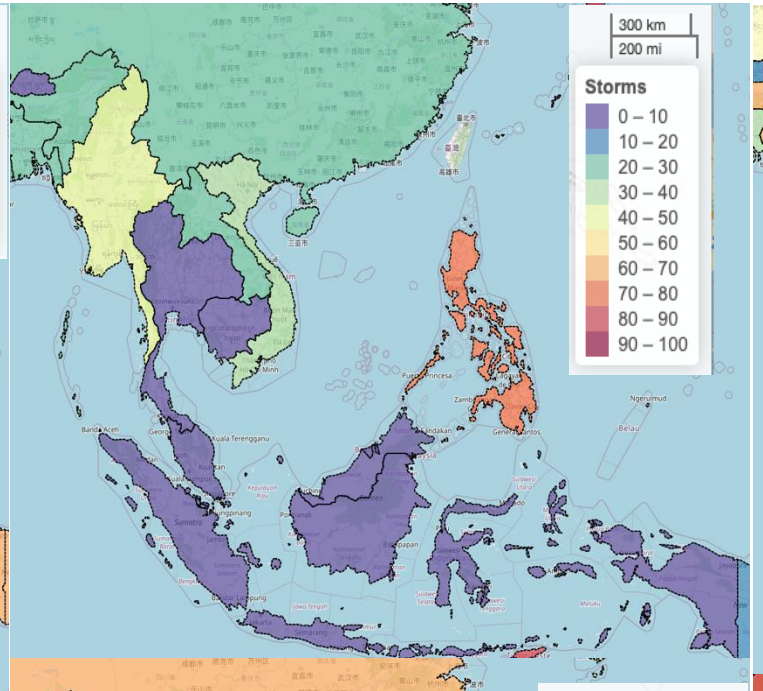
b

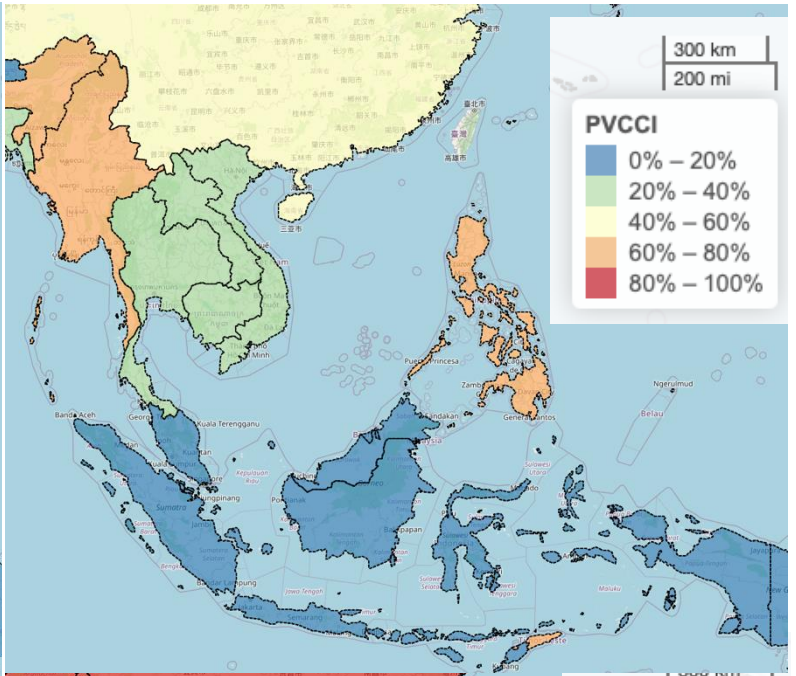
Biodiversity in the South China Sea is **1/3 of global** marine species count

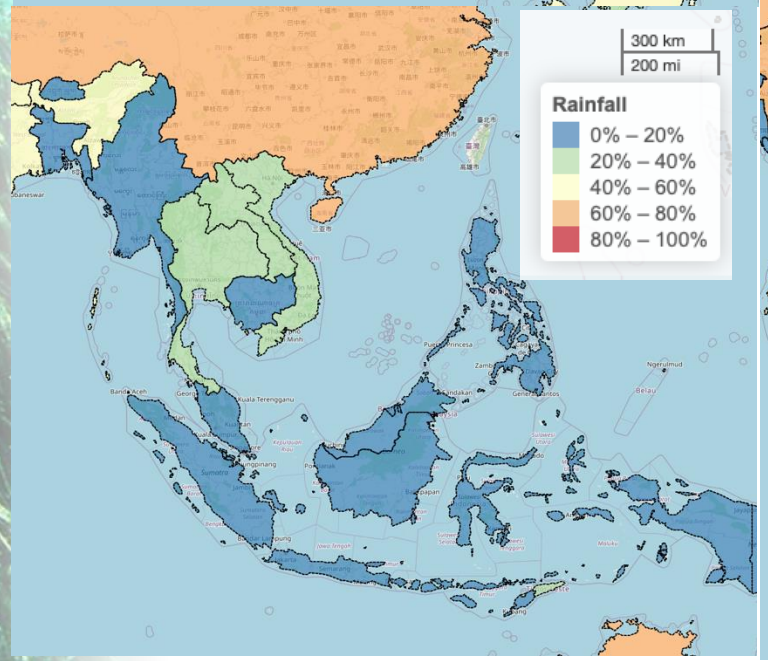
	**Mangroves**	**45 species** out of 80 worldwide
	**Seagrasses**	**21 species** out of 72 known
	**Reef-building corals**	**> 500 species** out of 800 worldwide
	**Reef fish**	**> 1120 species** or 1/3 of global count
	**Marine turtles**	**6 species** of 7 worldwide

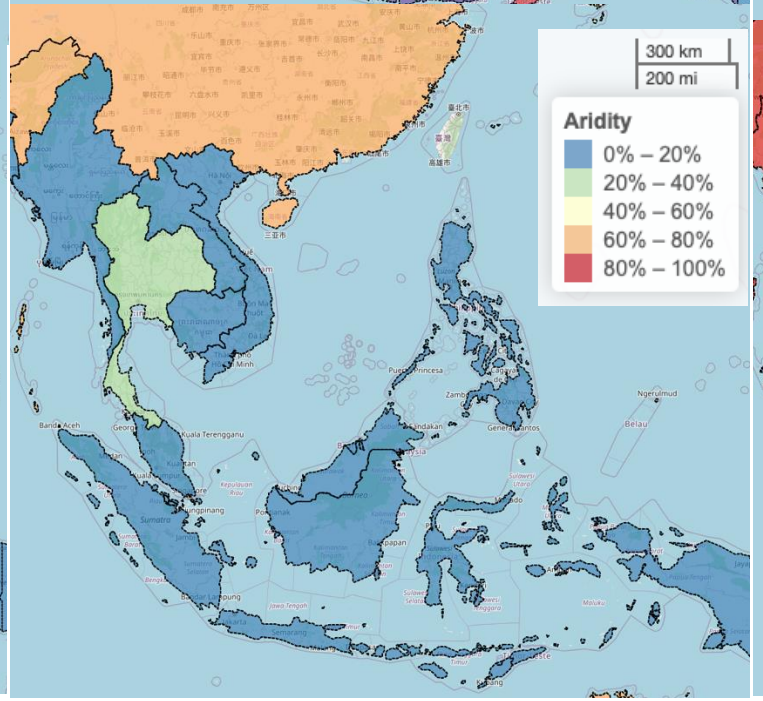
Physical Vulnerability to Climate Change Index (PVCCI)

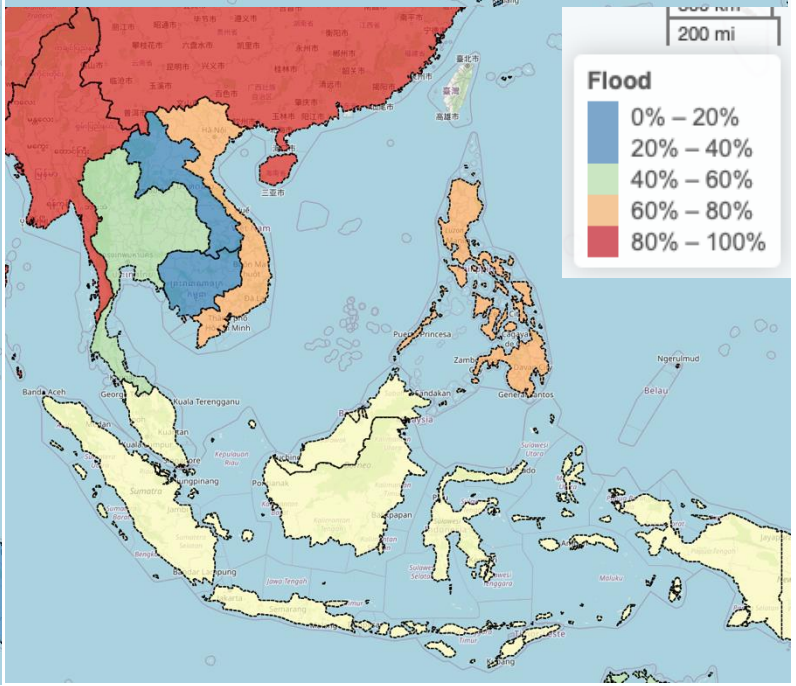












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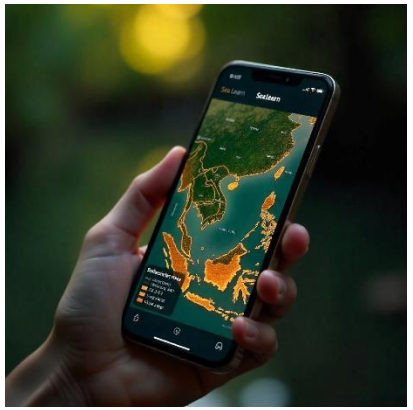
Regional TDA:

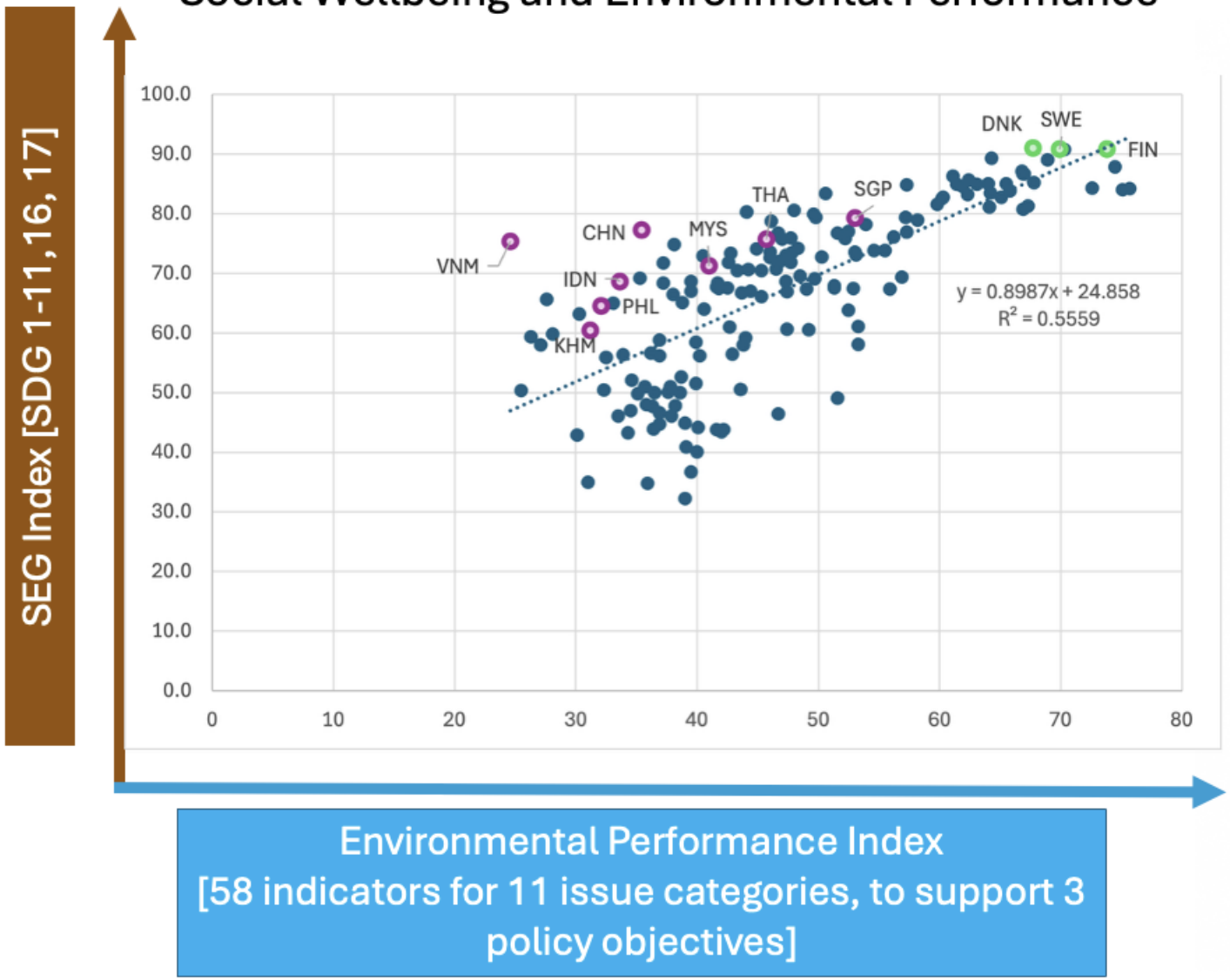
Are the coastal citizens around the SCS-GoT at risk?

By: Liana Talaue McManus

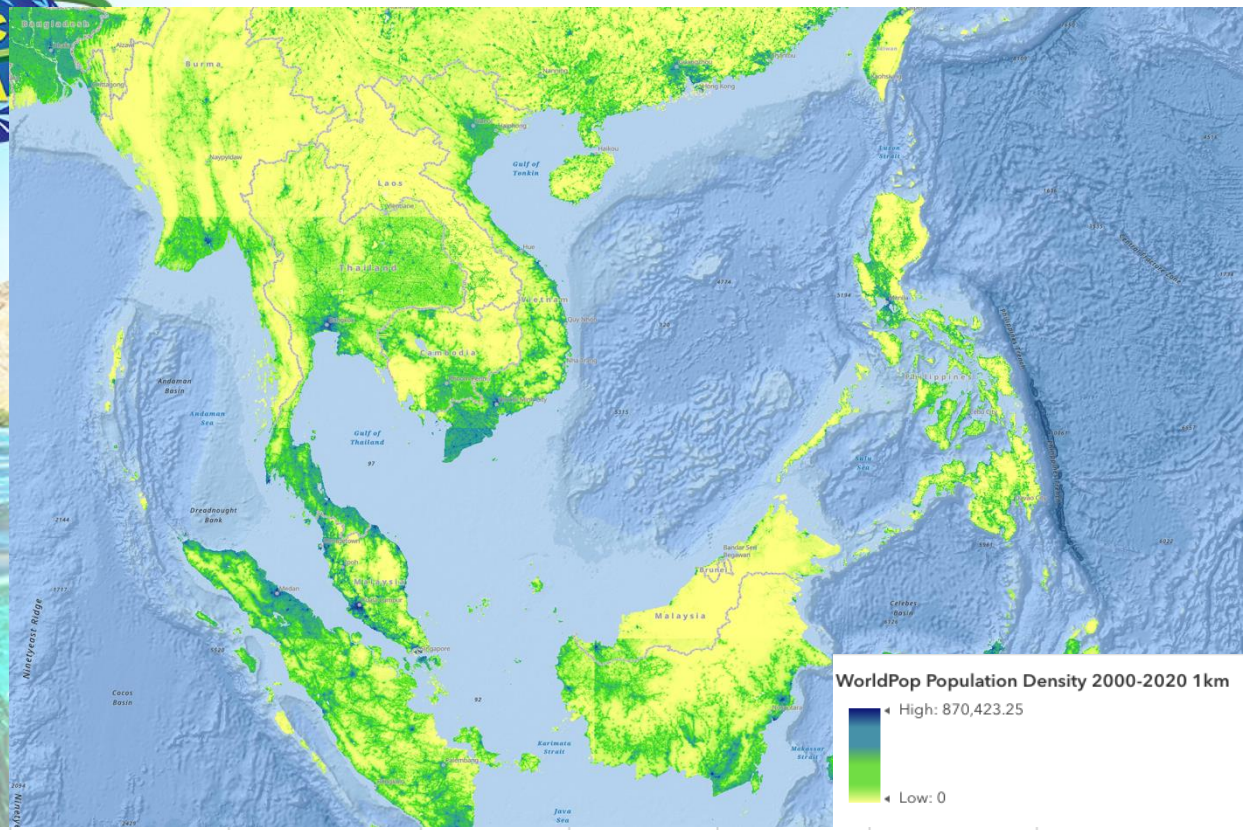
While humans are responsible for climate change, they have the creative energy to design solutions that align with their survival as part of the living world.



Social Wellbeing and Environmental Performance



Social Wellbeing and Environmental Performance are two sides of the same coin, called Resilient Sustainability. One cannot be achieved without the other.



Country	Population 2025	World Share %	Fert. Rate	Yearly Population Change	Median Age	Urban Pop %
China	1,416,096,094	17.20%	1.02	−0.23%	40.1	67.5%
Indonesia	285,721,236	3.47%	2.1	0.79%	30.4	59.6%
Philippines	116,786,962	1.42%	1.88	0.81%	26.1	49.3%
Vietnam	101,598,527	1.23%	1.88	0.60%	33.4	41.4%
Thailand	71,619,863	0.87%	1.2	−0.07%	40.6	53.5%
Malaysia	35,977,838	0.44%	1.53	1.18%	31	77.4%
Cambodia	17,847,982	0.22%	2.51	1.19%	26.2	26.5%
Singapore	5,870,750	0.07%	0.96	0.66%	36.2	100.0%
Maritime SE Asia	635,423,158	8%	1.89		31.2	54.6%
SCS-GoT	2,051,519,252	25%	1.29		37.3	63.5%

Total Population Size of South China Sea Countries (millions)

1,736 *2000*

2,019 *2020*

2,029 *2022*

2,052 *2025*

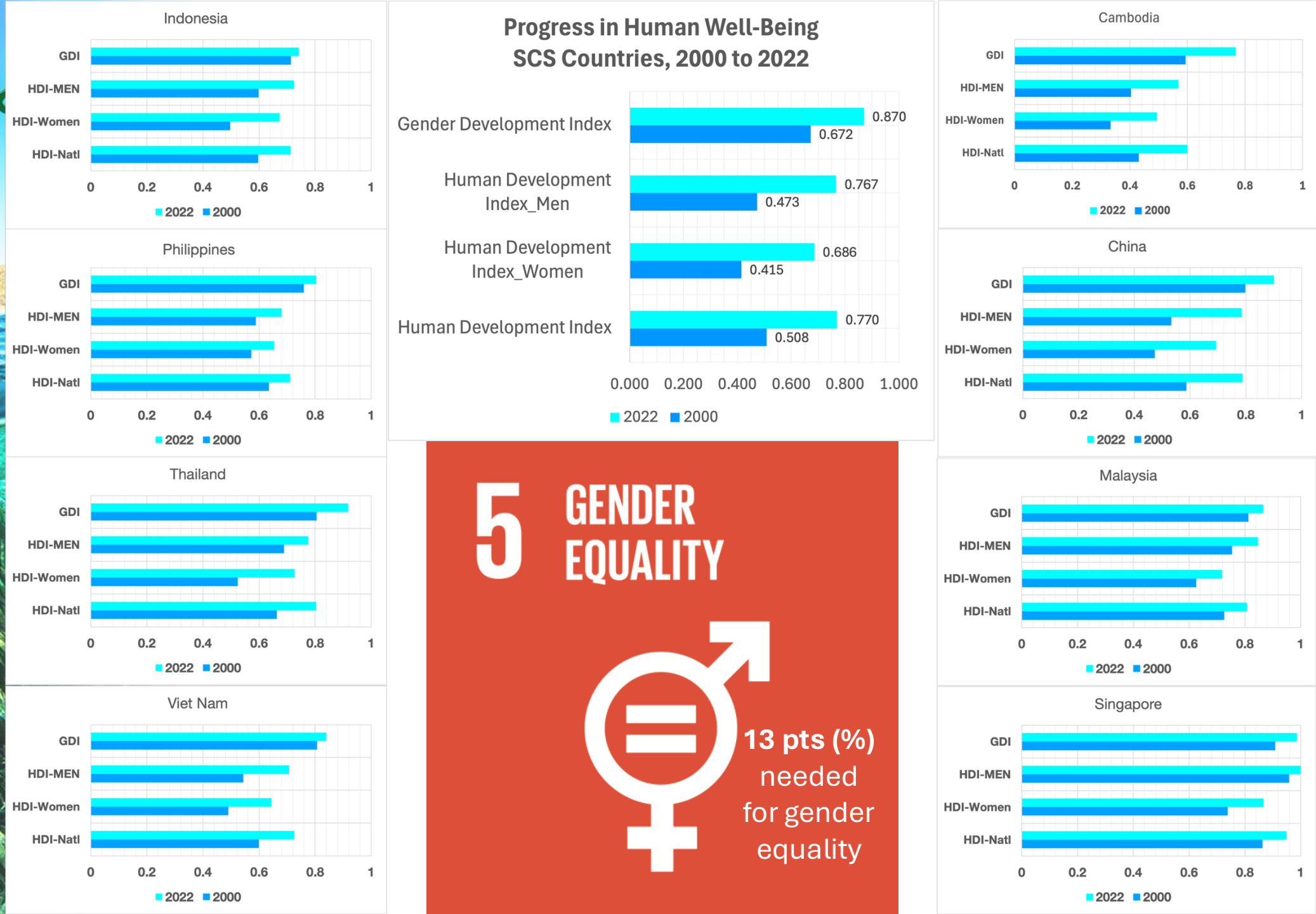
Coastal Populations (millions) in 2020

2,019 *Population of 8 coastal countries*

545 *Population of 80 coastal provinces*

85 *Coastal residents within 4 km of the sea*

40 *People residing below 5 m elevation along the coast*


Indonesia
GDI
HDI-MEN
HDI-Women
HDI-Natl
0
0.2
0.4
0.6
0.8
1
2022
2000
Philippines
GDI
HDI-MEN
HDI-Women
HDI-Natl
0
0.2
0.4
0.6
0.8
1
2022
2000
Thailand
GDI
HDI-MEN
HDI-Women
HDI-Natl
0
0.2
0.4
0.6
0.8
1
2022
2000
Viet Nam
GDI
HDI-MEN
HDI-Women
HDI-Natl
0
0.2
0.4
0.6
0.8
1
2022
2000
Progress in Human Well-Being
SCS Countries, 2000 to 2022
Gender Development Index
0.870
0.672
Human Development Index_Men
0.767
0.473
Human Development Index_Women
0.686
0.415
Human Development Index
0.770
0.508
0.000
0.200
0.400
0.600
0.800
1.000
2022
2000
5
GENDER EQUALITY
13 pts (%) needed for gender equality
Cambodia
GDI
HDI-MEN
HDI-Women
HDI-Natl
0
0.2
0.4
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2022
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China
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HDI-MEN
HDI-Women
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HDI-MEN
HDI-Women
HDI-Natl
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1
2022
2000

1 NO POVERTY

SDG 1 may take beyond 2030 to achieve.

2023 GNI per capita threshold 2023 Income classification	SCS Country	Poverty Threshold 2015 PPP USD	2020 Poverty headcounts SSP2- BAU	 SSP3	2030 Poverty headcounts SSP2- BAU	 SSP3
Low-Middle Income US$ 1136-4495	Cambodia	3.2	2,240,212	2,435,946	657,407	1,160,707
	Philippines	3.2	16,055,167	18,240,751	8,820,237	15,782,757
	Vietnam	3.2	18,908,463	20,107,742	8,350,876	11,784,653
Upper-Middle Income US$ 4496-13935	China	5.5	289,016,513	304,634,752	104,956,045	157,359,971
	Indonesia	5.5	74,280,169	77,966,588	29,936,369	42,985,893
	Malaysia	5.5	4,758,876	5,020,826	3,176,416	4,197,233
	Thailand	5.5	7,236,252	7,983,895	1,616,902	3,461,263
High Income US$ >13935	Singapore	5.5	134,093	143,273	89,833	117,111
		Total	412,629,745	436,533,773	157,604,084	236,849,588

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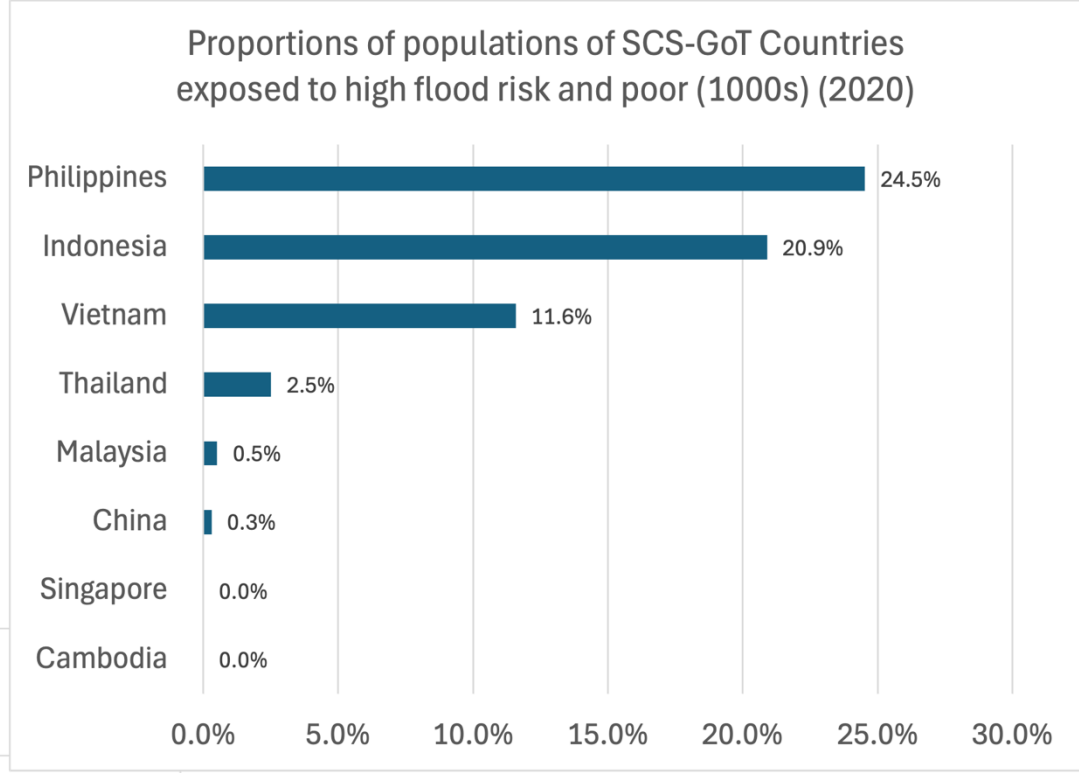

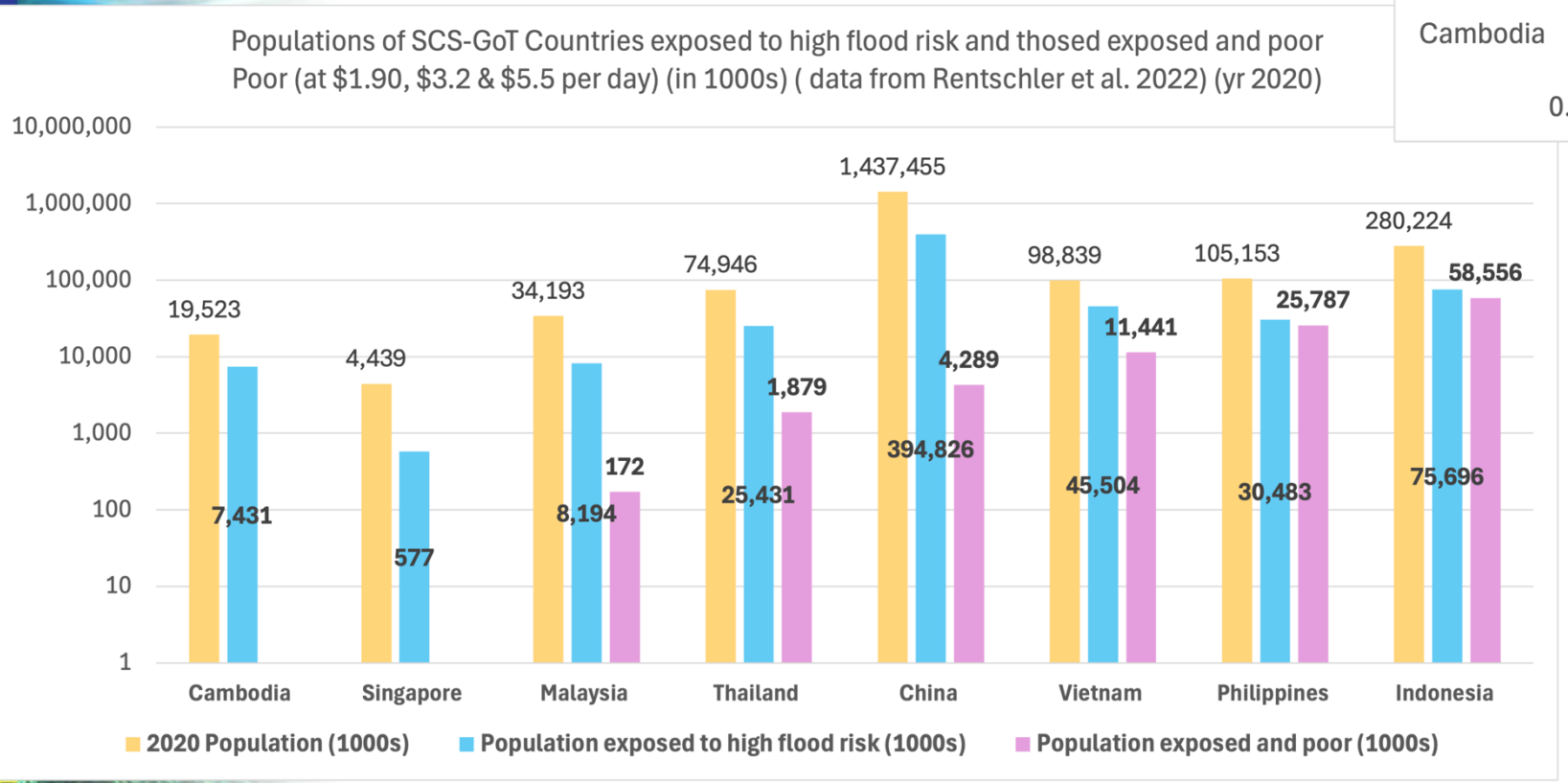

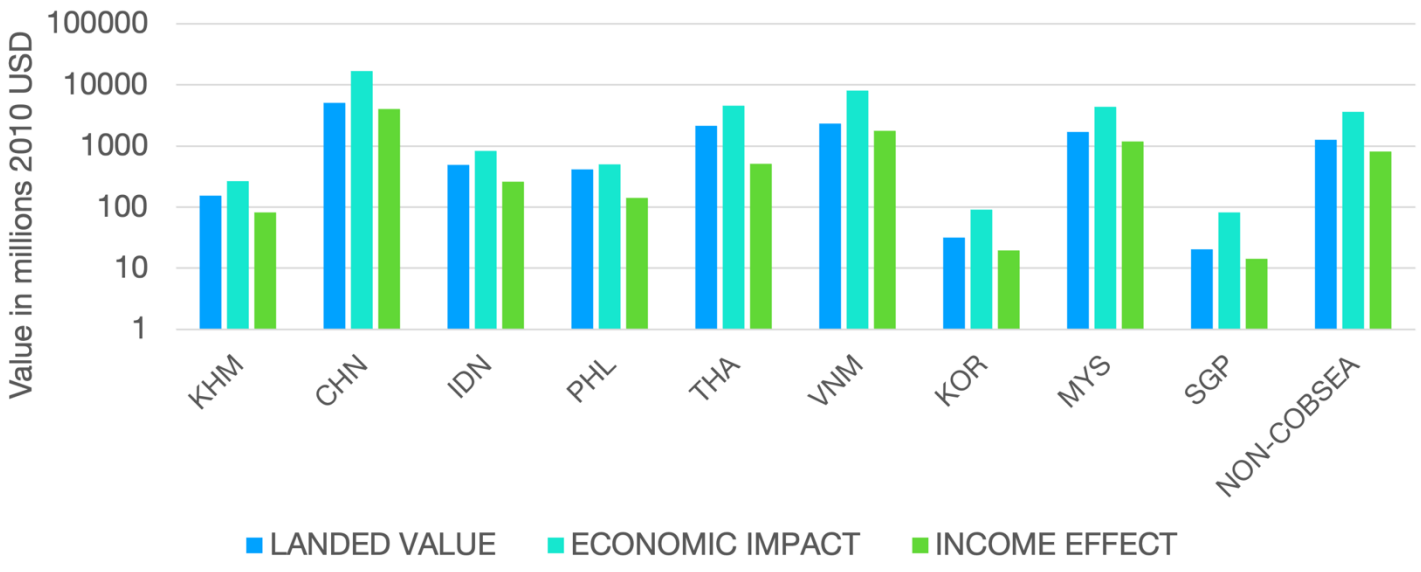

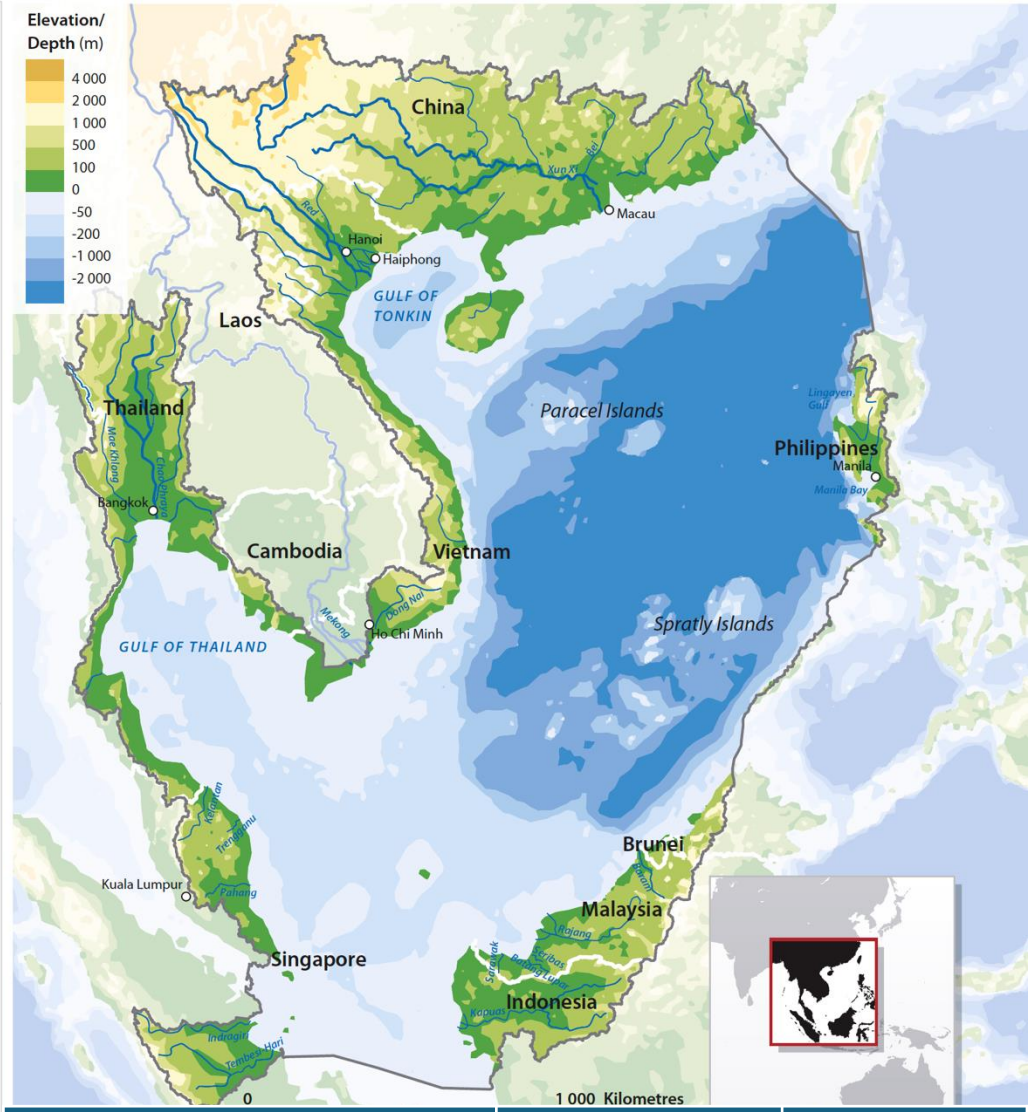

Millions **2010 USD**	**2000**	**2019**
Landed Value	13,600	19,400
Economic Impact	39,200	59,100
Income Effect	9,000	13,600

Coral Reef Tourism in COBSEA Countries

Country	Total reef area (km^2)	Area of reefs used for tourism	Value of coral reefs per year (2013 USD)	Reef visitor expenditures as % Total tourism	Reef tourism as % GDP	Mean value of reef as tourist attraction (2013 USD/ km^2)
Cambodia	116	79 (68%)	$18,070,000	0.87%	0.13%	$157,629
China	351	228 (65%)	$1,435,090,048	0.45%	0.02%	$3,110,617
Indonesia	39,507	9,087 (23%)	$3,054,259,968	7.80%	0.34%	$78,342
Philippines	22,456	7,823 (34%)	$1,354,889,984	8.83%	0.55%	$61,607
Thailand	522	522 (100%)	$2,407,579,904	5.65%	0.61%	$4,619,366
Viet Nam	777	543 (70%)	$136,031,008	1.52%	0.09%	$177,006
Malaysia	2,965	1,816 (61%)	$1,144,220,032	3.36%	0.37%	$391,467

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Statistical Relationships	Domain	Sustainable Development Goals
1. Socioeconomic Goal indicators are positively correlated with each other. 2. These were negatively or not correlated with Environment indicators 3. Scores for these 13 goals were averaged to create a Socioeconomics Index for each country (Y-axis, Figure 3.6)	Socio-economics & Governance	1 NO POVERTY 2 ZERO HUNGER 3 GOOD HEALTH AND WELL-BEING 4 QUALITY EDUCATION 5 GENDER EQUALITY 6 CLEAN WATER AND SANITATION 7 AFFORDABLE AND CLEAN ENERGY 8 DECENT WORK AND ECONOMIC GROWTH 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 10 REDUCED INEQUALITIES 11 SUSTAINABLE CITIES AND COMMUNITIES 16 PEACE, JUSTICE AND STRONG INSTITUTIONS 17 PARTNERSHIPS FOR THE GOALS
1. Scores for 4 Environment Goals and the International Spillovers Score were averaged to generate an Environment Index for each country (X-axis, Figure 3.6)	Environment	12 RESPONSIBLE CONSUMPTION AND PRODUCTION 13 CLIMATE ACTION 14 LIFE BELOW WATER 15 LIFE ON LAND International Spillovers Score

Country	2024 SDG Index Score	2024 SDG Index Rank	SDG1: No Poverty		SDG2: No Hunger		SDG3: Good Health and Well-Being		SDG4: Quality Education		SDG5: Gender Equality	
Thailand	74.67	45		↑		→		↗		↑		→
Vietnam	73.32	54		↑		↗		↗		→		→
Singapore	71.41	65				↓		↗		→		↗
China	70.85	68		↑		→		↗				→
Indonesia	69.43	78		↑		→		↗		↑		↗
Malaysia	69.32	79		↑		→		↗		→		↗
Philippines	67.47	92		↗		↗		→		→		→
Cambodia	64.90	104				↗		→		→		→

Country	2024 SDG Index Score	2024 SDG Index Rank	SDG6: Clean Water and Sanitation		SDG7: Affordable and Clean Energy		SDG8: Decent Work and Economic Growth		SDG9: Industry, Innovation & Infrastructure		SDG10: Reduced Inequalities	
Thailand	74.67	45		↗		↗		→		↑		→
Vietnam	73.32	54		↗		↗		→		↗		↓
Singapore	71.41	65		↗		↗		↗		↗		
China	70.85	68		↗		↗		→		↑		↗
Indonesia	69.43	78		↗		↗		↗		↗		→
Malaysia	69.32	79		↗		→		→		↗		→
Philippines	67.47	92		→		→		↗		↗		↗
Cambodia	64.90	104		↗		↗		→		↗		

Country	2024 SDG Index Score	2024 SDG Index Rank	SDG11: Sustainable Cities and Communities		SDG12: Responsible Consumption & Production		SDG13: Climate Action		SDG14: Life Below Water		SDG15: Life on Land	
Thailand	74.67	45		↗		→		→		→		→
Vietnam	73.32	54		→		→		→		→		→
Singapore	71.41	65		↑		↗		→		↗		→
China	70.85	68		↗		→		→		→		→
Indonesia	69.43	78		→		→		↗		→		→
Malaysia	69.32	79		↑		→		→		→		→
Philippines	67.47	92		→		→		↓		↗		↗
Cambodia	64.90	104		→		→		↓		→		→

Country	2024 SDG Index Score	2024 SDG Index Rank	SDG16: Peace, Justice and Strong Institutions		SDG17: Partnerships for the Goals	
Thailand	74.67	45		→		→
Vietnam	73.32	54		→		↗
Singapore	71.41	65		→		↗
China	70.85	68		↗		→
Indonesia	69.43	78		→		→
Malaysia	69.32	79		→		→
Philippines	67.47	92		→		↗
Cambodia	64.90	104		→		→

Dashboard :		Time Series :	
green	Goal Achievement	↑	On track or maintaining achievement
yellow	Challenges remain	↗	Moderately Increasing
orange	Significant challenges	→	Stagnating
red	Major challenges	↓	Decreasing
grey	Insufficient data		

This data should be cited as: Sachs, J.D., Lafortune, G., Fuller, G. (2024). The SDGs and the UN Summit of the Future. Sustainable Development Report 2024. Paris: SDSN, Dublin: Dublin University Press. doi:10.25546/108572

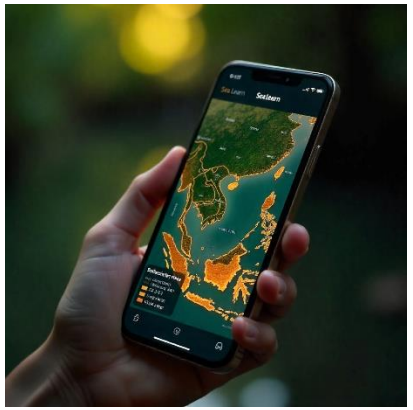
THANK YOU

RSTC3 Meeting
26-28 Jan 2026
Phú Quốc

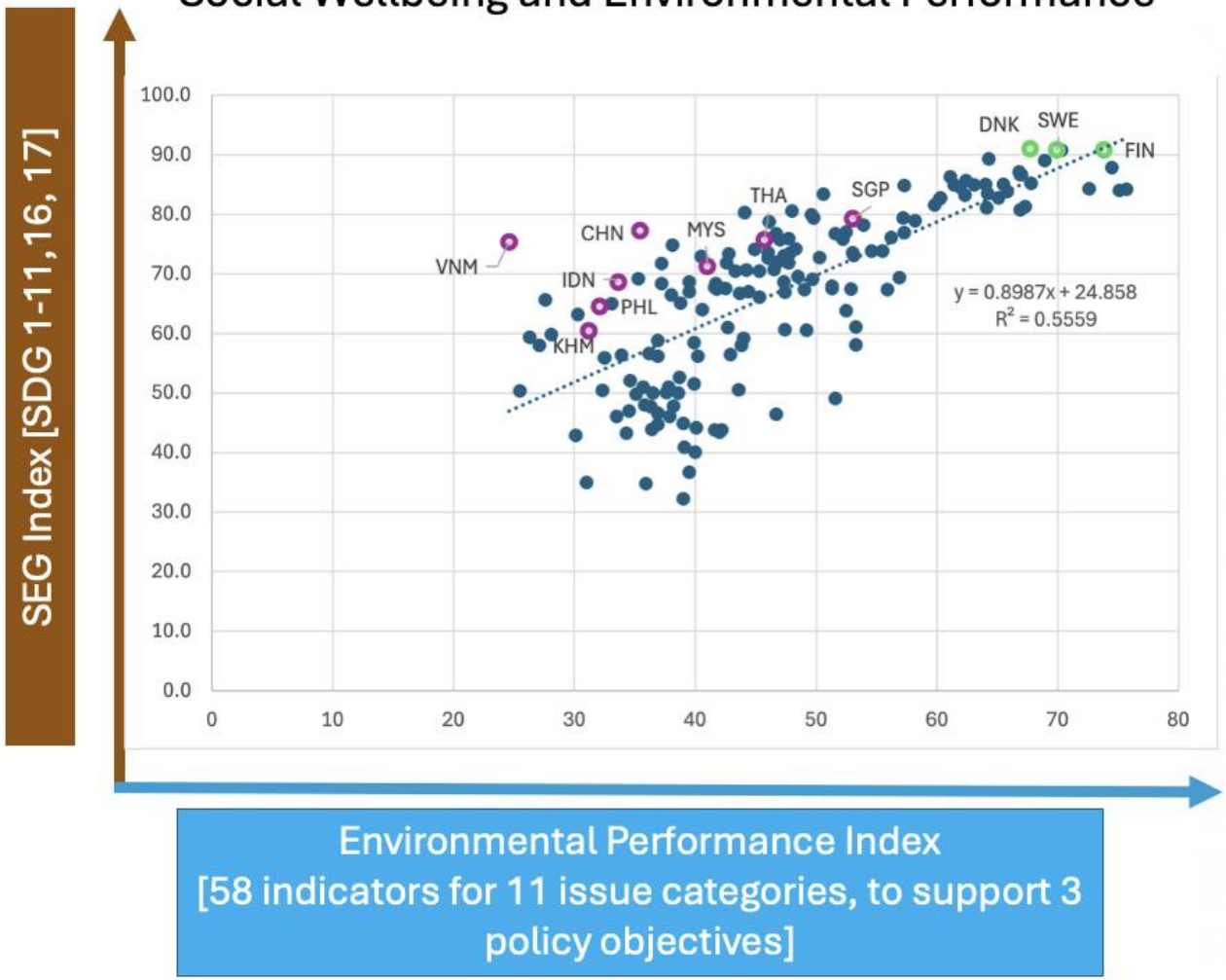
Regional TDA:

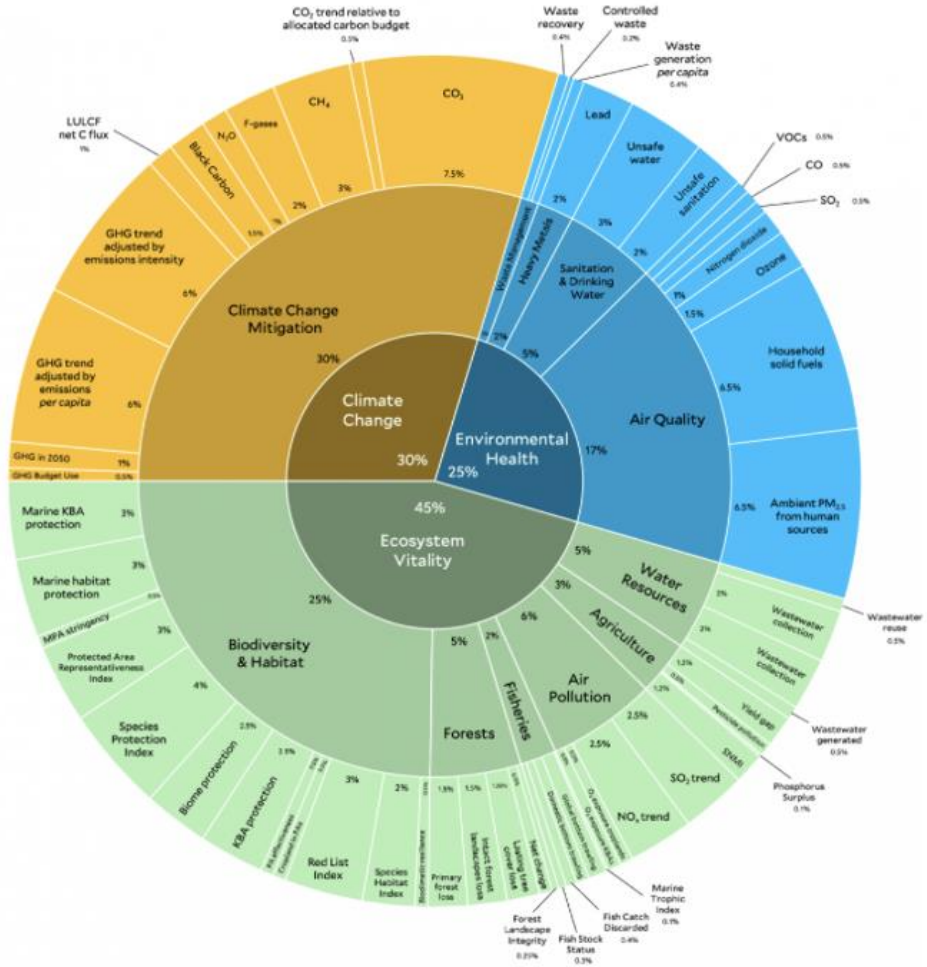
Synthesis and Conclusions

By: Regional TDA Team



Social Wellbeing and Environmental Performance





Social Wellbeing and Environmental Performance are two sides of the same coin, called Resilient Sustainability. One cannot be achieved without the other.

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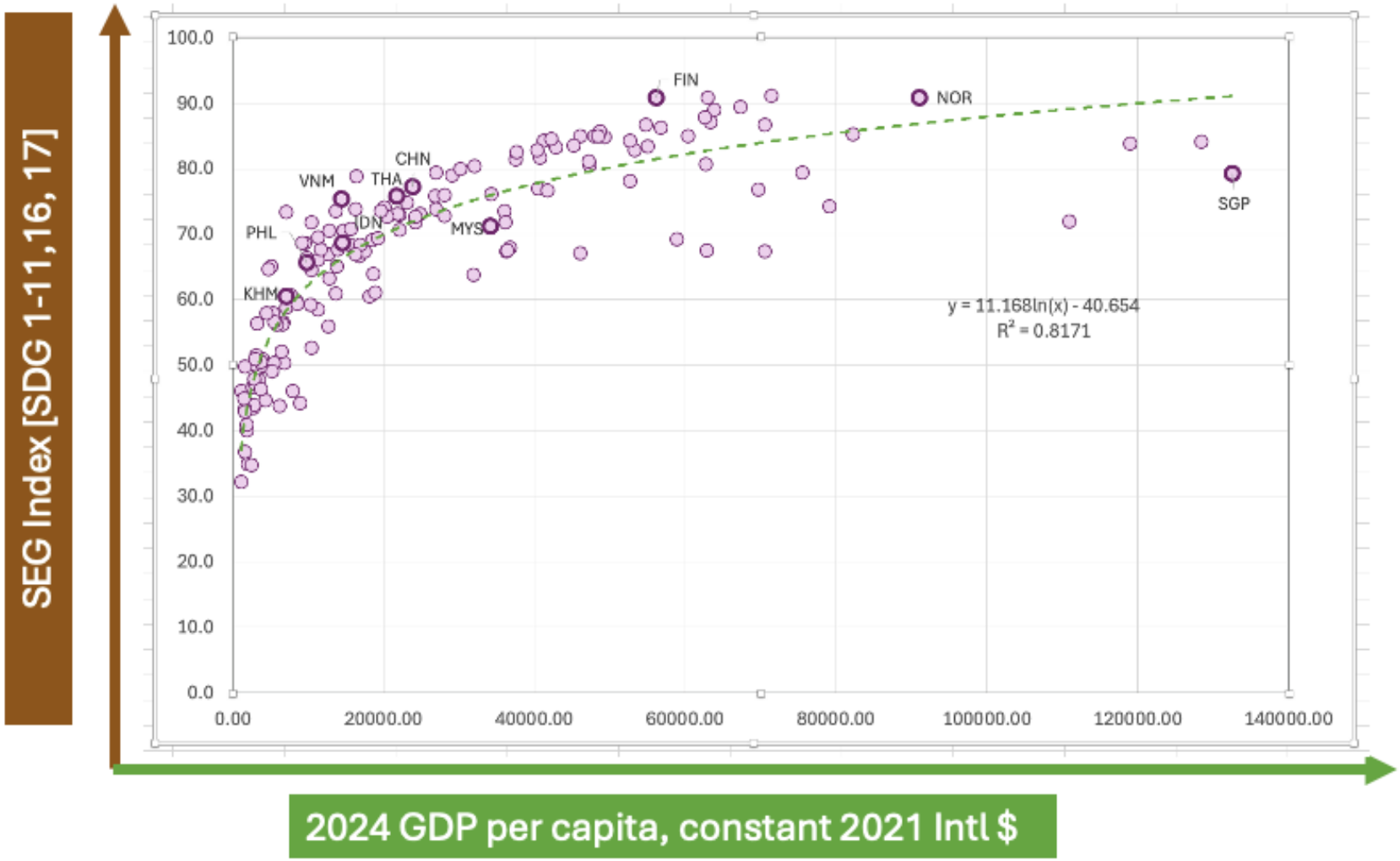
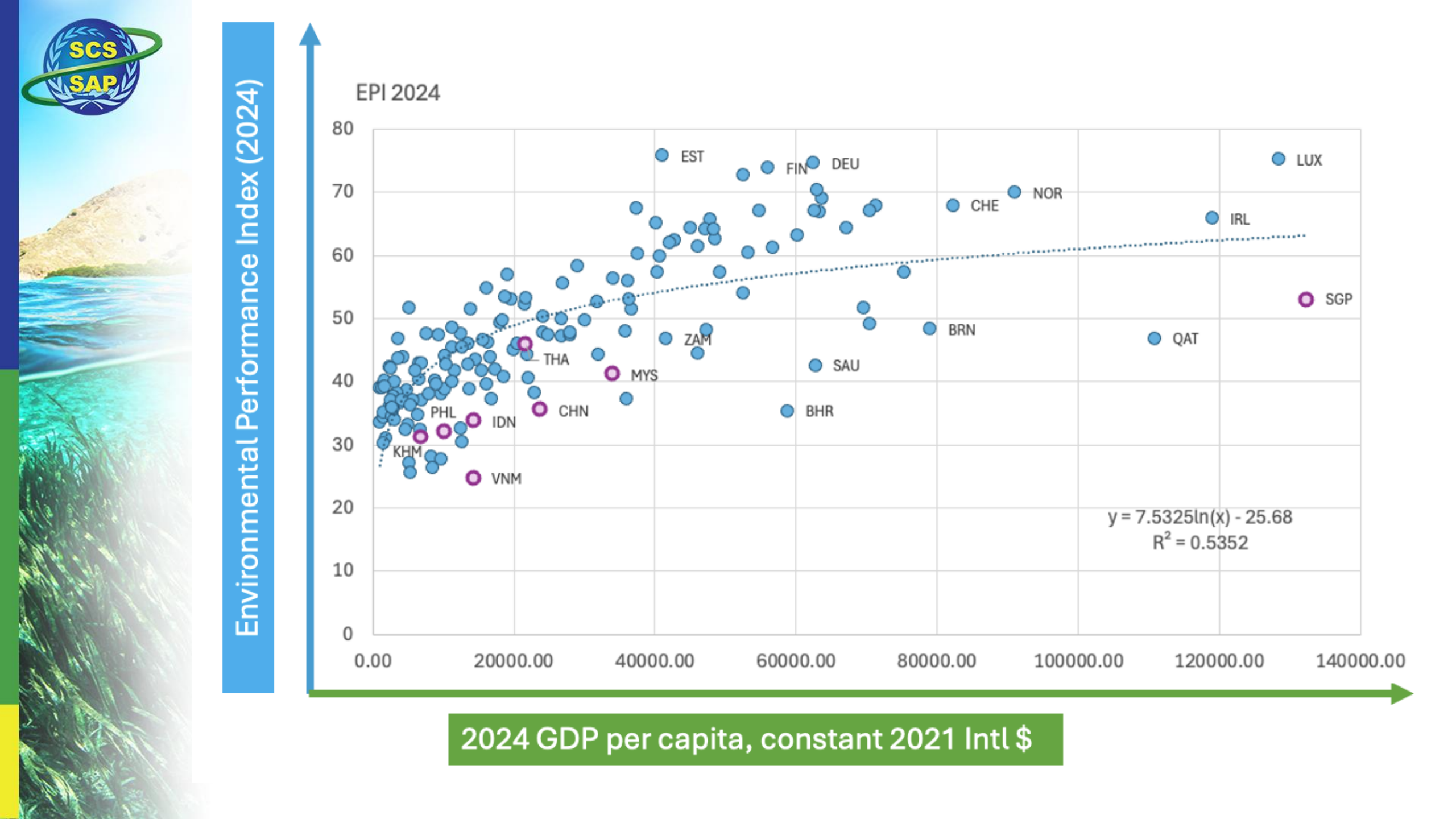
Social Wellbeing and Wealth



Social wellbeing and wealth is contingent on development phase: (1) survival phase – tight linear relationship; bend phase – growth in wealth increases consumption, which increases ecological footprint; flat phase – life satisfaction is not rising with GDP.


Environmental Performance Index (2024)
EPI 2024
80
70
60
50
40
30
20
10
0
0.00
20000.00
40000.00
60000.00
80000.00
100000.00
120000.00
140000.00
EST
FIN
DEU
LUX
CHE
NOR
IRL
SGP
BRN
QAT
ZAM
THA
MYS
SAU
CHN
BHR
PHL
IDN
KHM
VNM
y = 7.5325ln(x) - 25.68
R² = 0.5352
2024 GDP per capita, constant 2021 Intl $

Recommended Regional Actions Across Six Thematic Areas in the South China Sea and the Gulf of Thailand

A. Climate Change Adaptation

Sub-theme	Key Recommended Actions	Implementation Focus & Notes
	Establish Integrated Early Warning Systems (EWS) with community preparedness	Involve communities and achieve benefit-to-cost ratio >10 (Krishnan et al. 2025)
	Expand decentralized renewable energy systems (solar, wind)	Ensure post-disaster energy supply and increase community resilience (WRI 2025)
	Promote sustainable agriculture & land use (agroforestry, silvopasture, community forests)	Reduce land-use emissions (20% of GHG); enhance farmer resilience
	Invest in climate-smart buildings (passive cooling, reflective roofs, low-carbon materials)	Decrease building emissions (20% of GHG); provide co-benefits
	Expand urban green spaces	Lower ambient temperature through shading and evapotranspiration
	Protect & restore coastal ecosystems (mangroves, seagrass, coral)	Provide carbon sequestration, fisheries support, and natural flood defense
	Build stormwater drainage networks & detention basins	Reduce urban flooding; land-intensive (may not suit dense urban areas)
	Implement “soft” shoreline maintenance & flexible infrastructure planning	Use dunes, vegetation, setbacks; implement dynamic planning to reduce long-term risk (Feng et al. 2025)

B. Socioeconomic & Livelihoods

Sub-theme	Key Recommended Actions	Implementation Focus & Notes
	Promote gender equality in environmental governance	Empower women to assume leadership roles: habitat restoration, sustainable fishing, plastic waste initiatives, climate-friendly consumption
	Poverty alleviation through cash transfer programs & vocational training	Build on Indonesia/Philippines models; youth training in digital monitoring, citizen science, climate outreach
	Ensure inclusive community participation in decision-making	Enable vulnerable groups to participate in environmental governance & solution design

C. Pollution Control

Sub-theme	Key Recommended Actions	Implementation Focus & Notes
	Update SAP priorities for 2030 and 2050	Reflect rising plastic leakage and stronger climate and storm pressures.
	Adopt a regional legally binding pollution framework	Build on existing regional instruments and agree on shared targets and obligations.
	Invest in land-based pollution control for coastal cities	Package wastewater and solid-waste upgrades; prioritize hotspots and high-exposure cities.
	Climate-proof waste and wastewater systems	Storm-safe design, redundancy, overflow controls, safer siting; align with land-use planning and marine spatial planning.
	Build a regional Monitoring Review Verification (MRV) and performance scorecard	Shared indicators and reporting; data platform for tracking delivery and benchmarking progress.

	Reduce nutrient loads in priority watersheds	Reform fertilizer incentives; scale precision nutrient management and farmer advisory support.
	Align plastics measures and EPR across the region	Common standards and coordinated action plans; comparable data and scenario tools to guide choices.

D. Marine Habitats & Ecosystems

Sub-theme	Key Recommended Actions	Implementation Focus & Notes
	Manage biodiversity hotspots with locally appropriate restoration & management	Customize actions to habitat status, impacts, and resilience
	Develop & connect MPA & OECM networks	Improve management effectiveness and ecological connectivity
	Protect migratory species across nesting/feeding areas	Exchange information and conservation techniques, reduce bycatch
	Enhance climate resilience & reduce cumulative anthropogenic impacts	Plan for scenarios that feature unpredictable events
	Strengthen monitoring, evaluation, reporting & policy briefing	Enable adaptive management
	Promote transboundary cooperation (habitats, fisheries refugia, blue carbon, pollution, migratory species)	Encourage and support multi-theme, cross-border collaboration

E. Sustainable Fisheries Management

Sub-theme	Key Recommended Actions	Implementation Focus & Notes
	**Gulf of Thailand (Recovery Challenge):** Drastically reduce fishing capacity (especially bottom trawlers) and enhance bilateral cooperation and enforcement	• Adopt Ecosystem-Based Fisheries Management (EBFM) • Eliminate Illegal, Unregulated and Unreported (IUU) fishing • Strengthen Monitoring Control and Surveillance (MCS) systems • Invest in shared science & stock assessment. • Phase out harmful subsidies • Promote sustainable aquaculture
	**South China Sea (Prevention Challenge):** Establish Regional Fisheries Management Organization (RFMO); set shared TACs; protect spawning grounds	

F. Governance and Collaboration

Sub-theme	Key Recommended Actions	Implementation Focus & Notes
	Strengthen existing platforms:	COBSEA (coordination), PEMSEA (data/community), ASEAN (policy dialogue), regional research networks
	Accelerate progress toward UNSDG 14 by 2030	Reverse trends in overfishing, pollution, habitat loss, climate impacts
	Establish effective transboundary governance mechanisms	Harmonize policies, coordinate science, implement cross-border conservation
	Ensure integrated, equitable policies & funding	Reach remote/vulnerable communities; distribute resources fairly
	Long-term vision: Create a fully functional intergovernmental regional authority for SCS & GoT	Apex body for integrated marine governance

Transformative, integrated and cooperative Governance is key to a sustainable future for the SCS-GoT LMEs

Urgent proactive, integrated and cooperative action is needed that addresses the triple planetary crisis for a sustainable future in the SCS-GoT.

Global and regional treaties (UNCLOS, SDGs and ASEAN) set high level legal and policies, need strengthening and shared commitment.

Regional mechanisms (COBSEA, PEMSEA, ASEAN, ect) need to be strengthened with clear agenda-setting, coalition building, leadership supported by a robust institution, with systemic integration to amplify efforts.

Political commitment, sustained investment, and capacity, is necessary, at all levels, through strong integrated national governance, incentives, legitimacy and cost benefit realism.

A Source to Sea approach adopted, with harmonized policies and laws, and inclusive and participatory decision-making, planning and management.

Technology, infrastructure, adaptation, knowledge sharing, monitoring, evaluation, control and surveillance are tools that need to be adopted.

THANK YOU