

MIT Global Change Forum 48

Session 2

Achieving multiple socio-economic targets

**Measuring what Matters:
Beyond GDP**

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26th March 2026

11:15 am – 12:30 pm USA EST

IPCC AR6 WGIII – Context and Critique

IPCC global scenarios are instrumental for negotiators in establishing reduction targets and outlining international agreements and strategies including Kyoto Protocol, Paris Agreement, Glasgow Pact and so on.

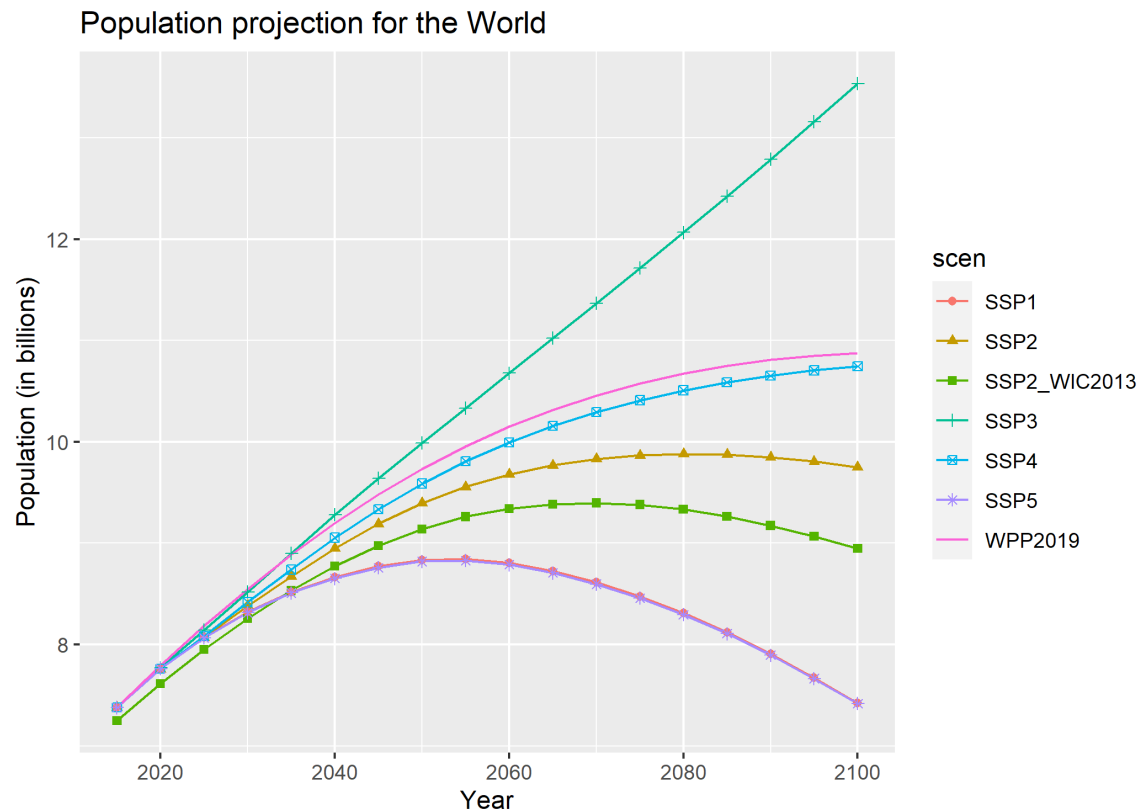
Limitations:

1. Pose challenges for **specific national contexts**
2. Suggest that IPCC **"impacts" assessments** may systematically overestimate negative global warming impacts while underestimating positive ones, which could influence national risk perceptions and policy responses
3. Highlight that global targets derived from some IPCC scenarios might inadvertently perpetuate energy deprivation, raising concerns for national policies aimed at **equitable development**, especially in developing countries
4. Call to shift the focus of IPCC scenarios from solely emission targets to broader **development and climate goals**, making them more transparent and policy-relevant in the context of development, socio-economic parameters debates at the national level

Main socio-economic parameters?

1

Population (Global)

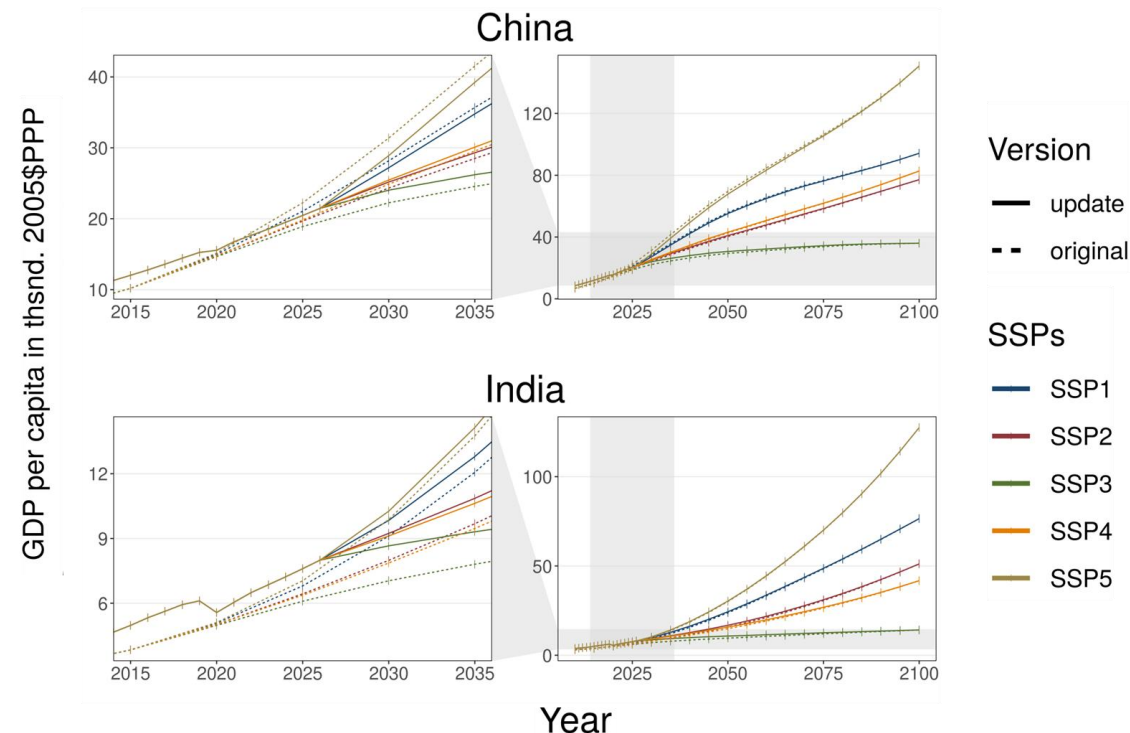


UN: Fertility, Mortality, Age, Sex, Migration
IIASA addition: Level of education
Additional parameters: Labor, Rural/Urban, Health

Source: Samir K. C. et al. (Scenario Forum 2022)

IAMC SWG National | MIT Global Change Forum 48

Gross Domestic Product (Global)



OECD: Physical capital, Labour capital, Total factor productivity, Energy demand, Natural resources value added

Source: Koch. et al. (Scenario Forum 2022)



IAMC – Integrated Assessment Modeling Consortium

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IAMC SWG on National Scenarios Current Status

Saritha Sudharma Vishwanathan (KU, IIMA)

Shinichiro Fujimori (KU, NIES, IIASA), Roberto Schaeffer (COPPE/UFRJ)

Acknowledgement:

Scenario data: Modelling Teams [National, Regional, Global, Subnational]

Vetting process: Anuj Pathak (PhD Student, KU), Shoyeb Khan (Research Associate, IIMA), Alauki Patel (Research Associate, IIMA)

Registration: Phillip Hackstock (Research Software Programmer and Data Steward, IIASA)

David Almeida (Research Software Programmer, IIASA)

Date: 26th March 2026 [11:15 am – 12:30 pm USA EST]

Registration and Submission

110+ teams – Interest Survey



96 teams registered

National (72 models)

Global (15 includes downscaling to region as well as countries)

Regional (2 – EU)

1- South East Asia (SEA),

1-East Asia)

Subnational (4 – upscaled or aggregated to national)

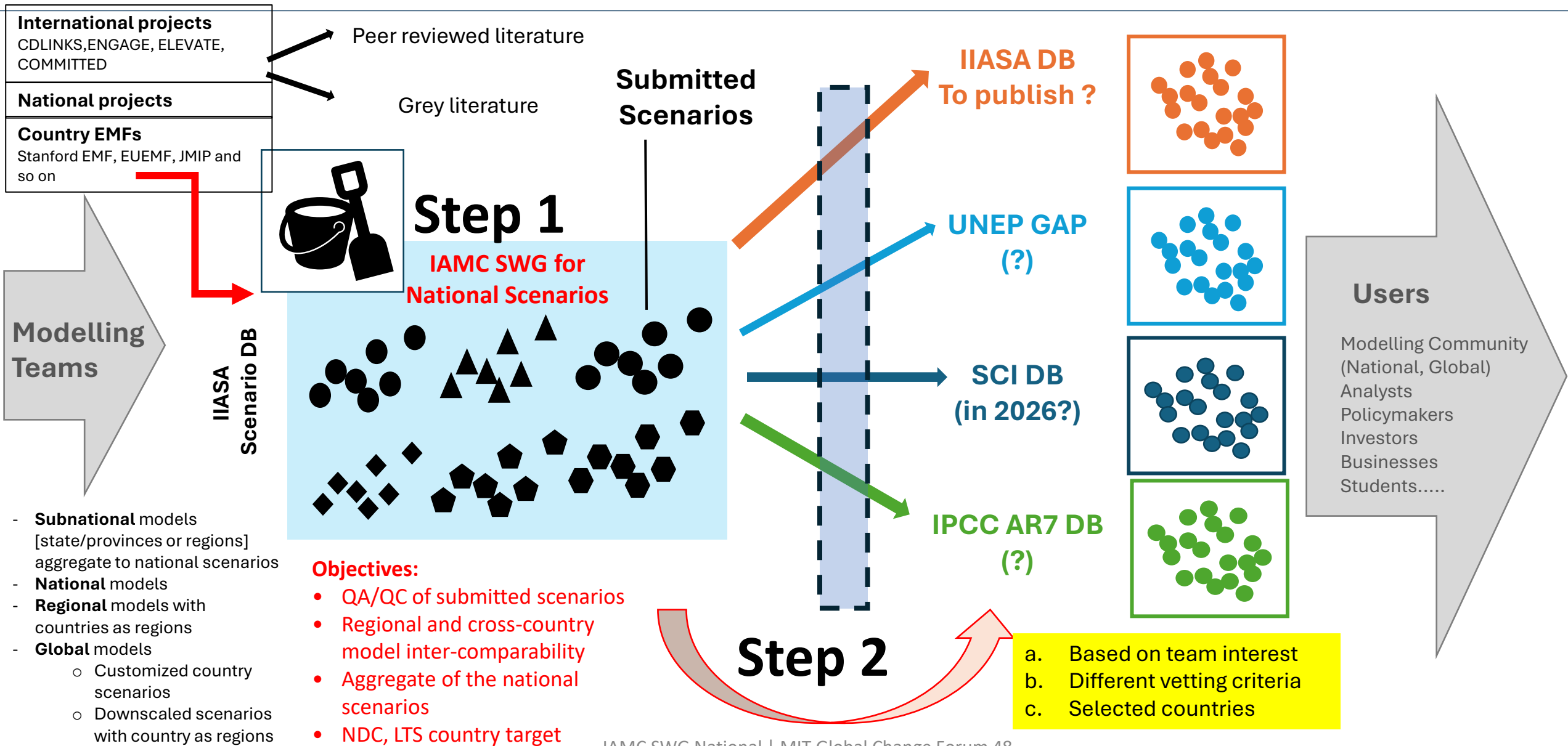
Capturing about
>70% CO2 emissions (36 countries)
>80% (Countries and regions included)

Submission Status

	Not Submitted	11 Countries
	Other	
	Submitted	29 Countries

IAMC SWG National Scenarios

Initial figure courtesy:
Scenario Compass Initiative
Figure updated to understand
IAMC SWG National work-flow



What is being done?



Do not quote Confidential

1

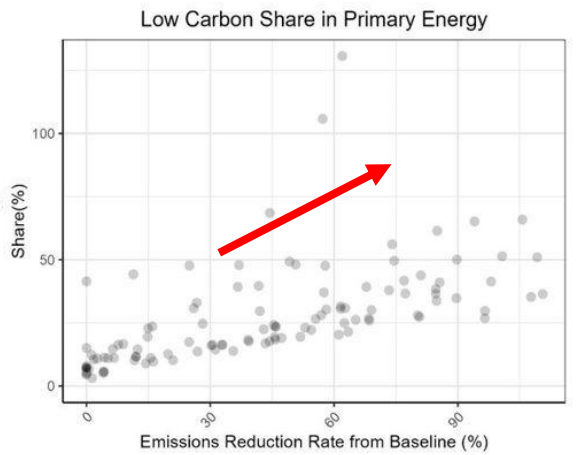
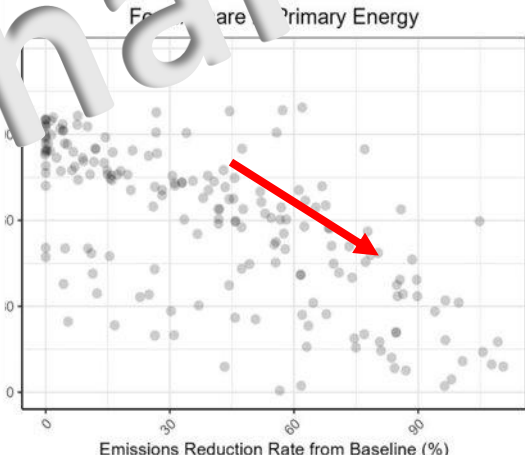
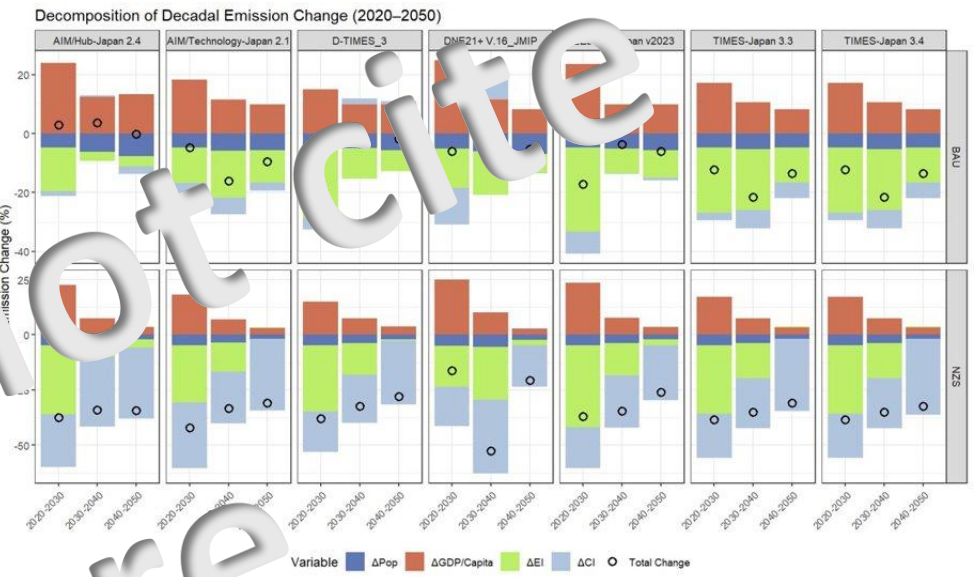
a

Scenarios Stocktake



b

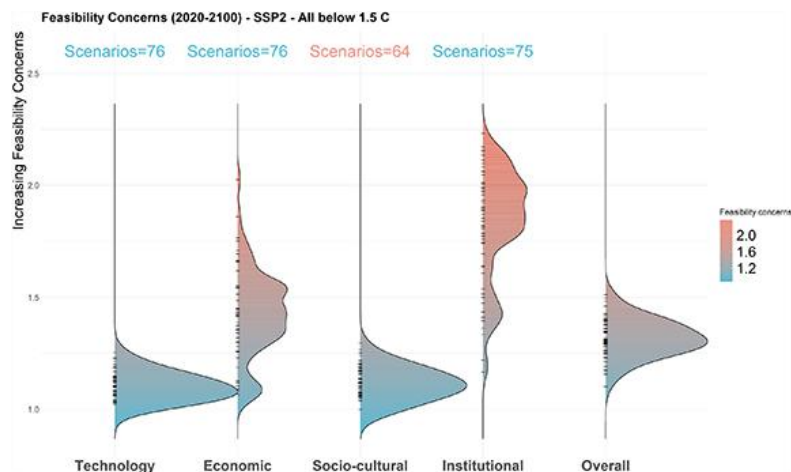
Similarities and Differences



WIP: please do not cite or share

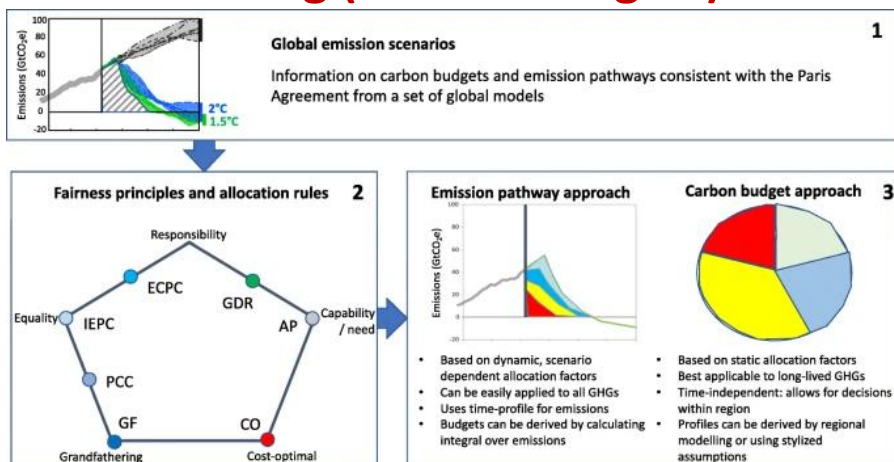
What can be done?

1 Feasibility of national scenarios



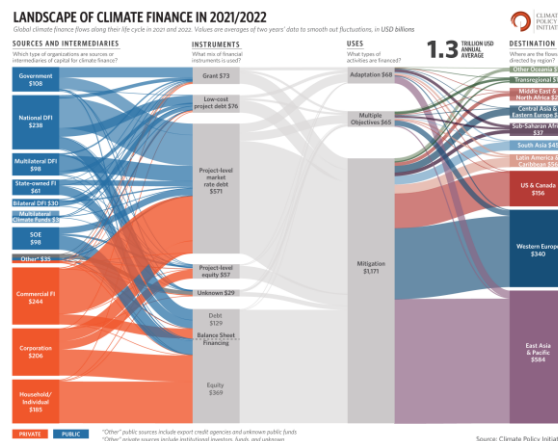
Source: Betram et al. 2021

Effort-sharing (Carbon budgets)



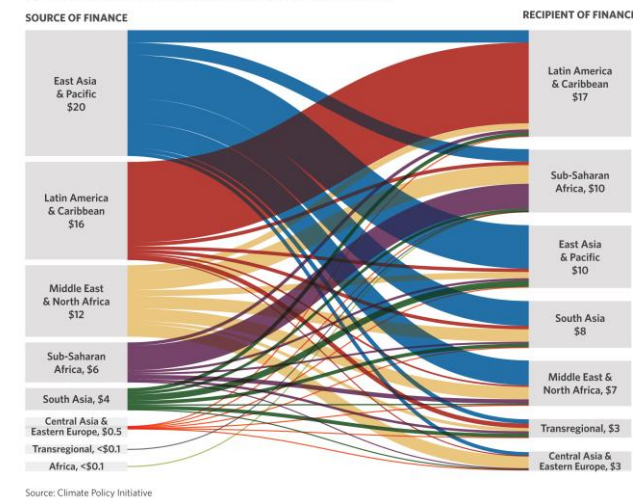
Source: Brustchin et al. 2021

Investment needs from national scenarios could be compared with financial flows



Source: Global landscape of climate finance 2024

Figure 3.8: Total South-South climate finance, 2018-2022 in USD bn

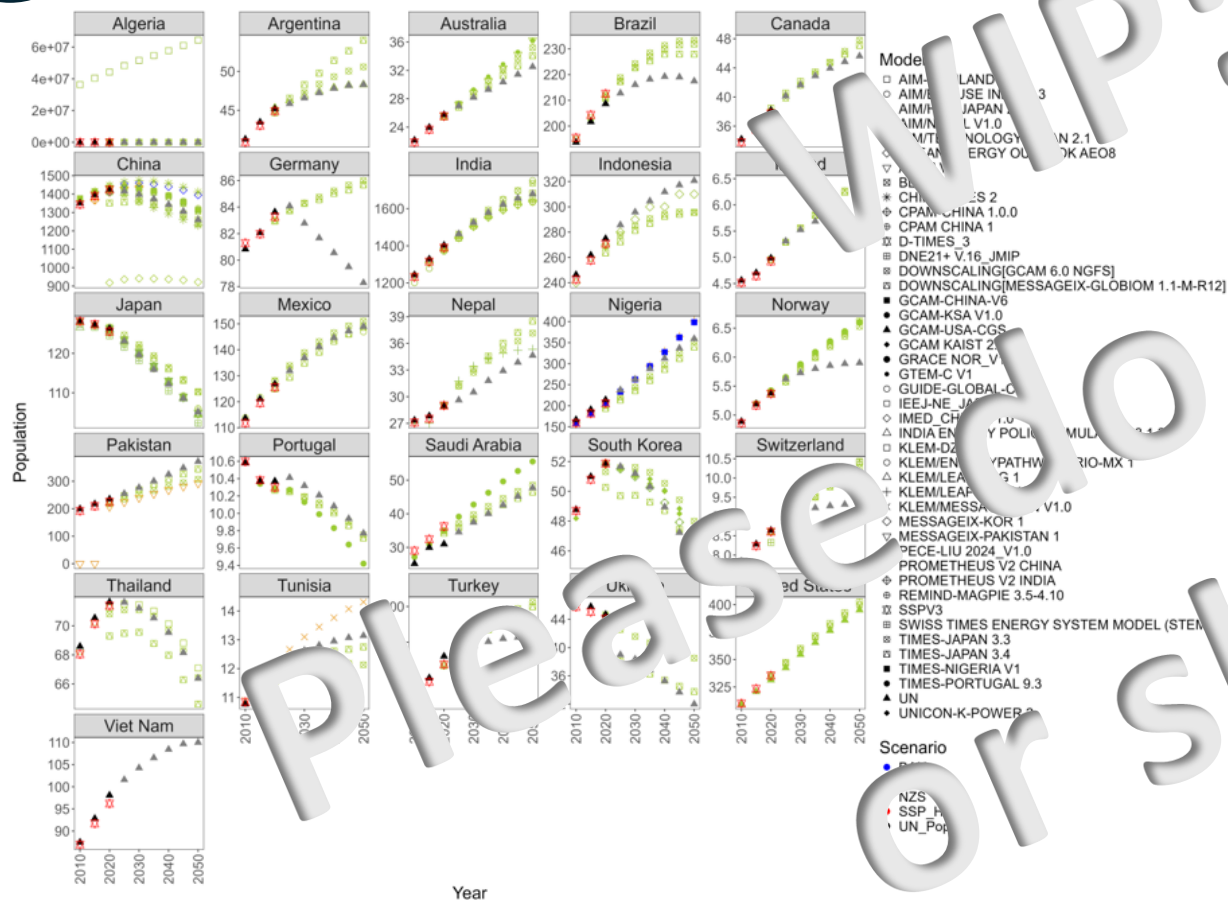


Source: Climate Policy Initiative

Main socio-economic parameters?

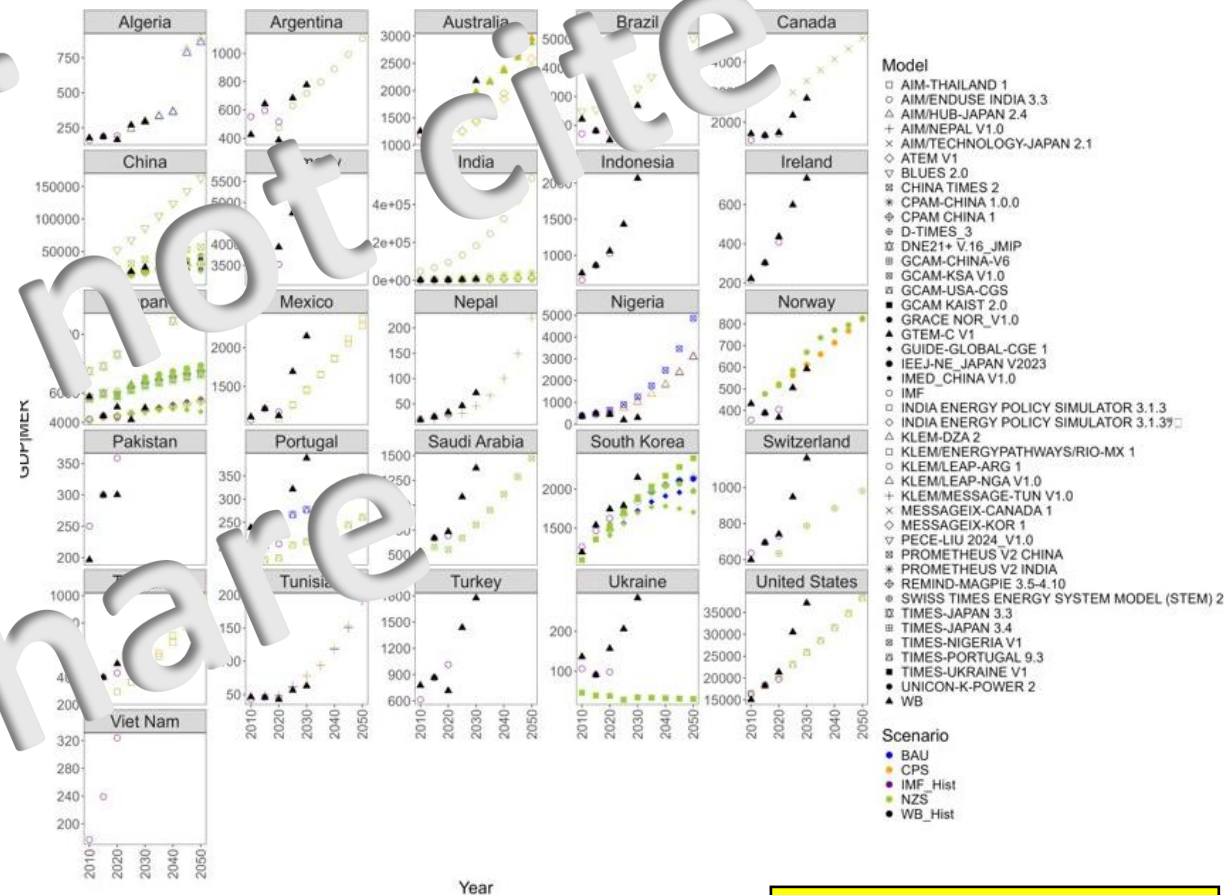
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Population (National)



Reference: Country (In Millions)

Gross Domestic Product (National)



Reference: Country (GDP MER)

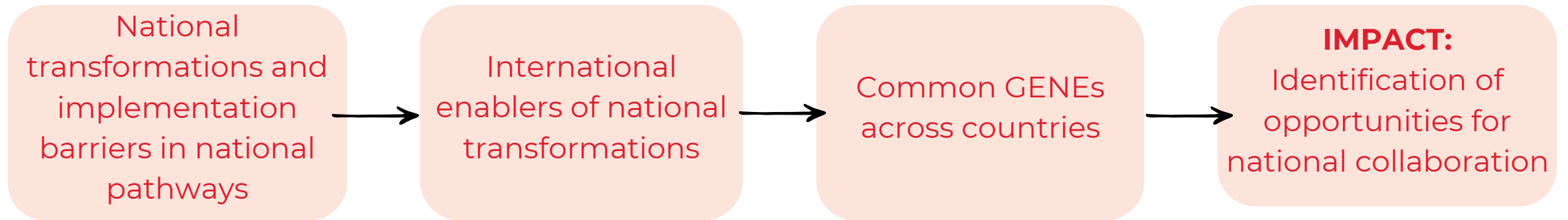
GDP|PPP (Global)
vs. GDP|MER
(National)

Global South, Local voices as Narratives and Quantitative Projections

Global Enabling Narrative Elements (GENEs)

Discussion at national level

Discussion at international level



From global perspective :
Interrogate national hypothesis

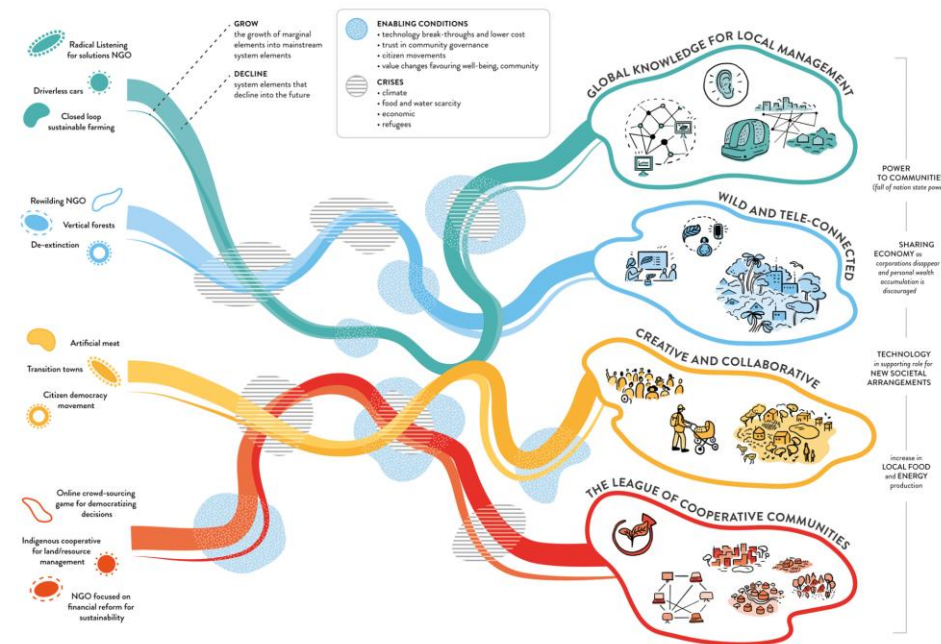
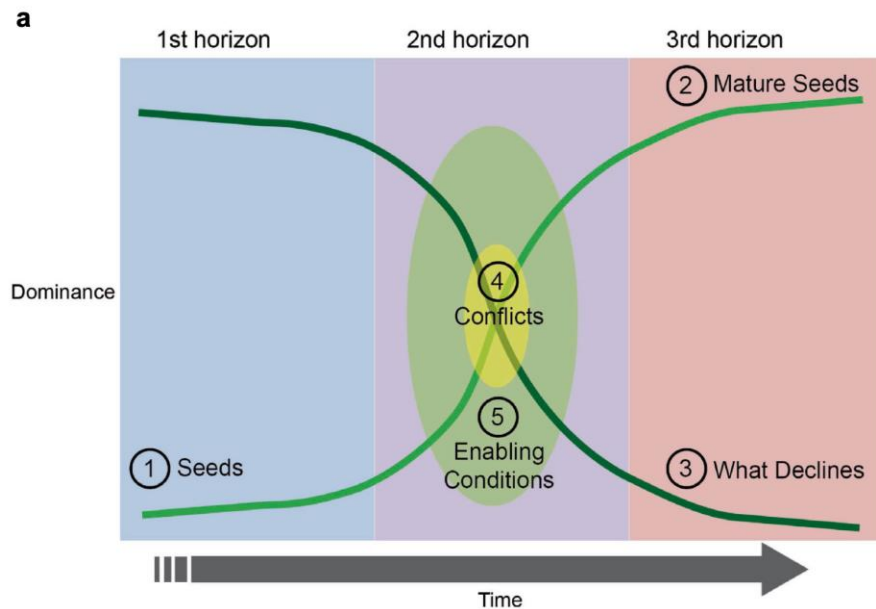
Global modelling
Global SSPs (?)



Finance
Trade
Technological innovation
Institutional capacity
Multi-level governance

Post-Growth Narratives (IPBES, IPCC)

1. Gather « **Seeds of transformative change** » through a survey
Seeds can be grassroots projects, public programs, research projects, public policies, or informal community practices...
Emerging from any domain (food, housing, mobility, energy, culture, governance, education, and health...)
At **Local, Subnational, Regional, National across sectors**
2. **2-day workshop** to build narratives from these seeds



Survey to
gather seeds

For any question :
gabriele.dabbaghian@enpc.fr

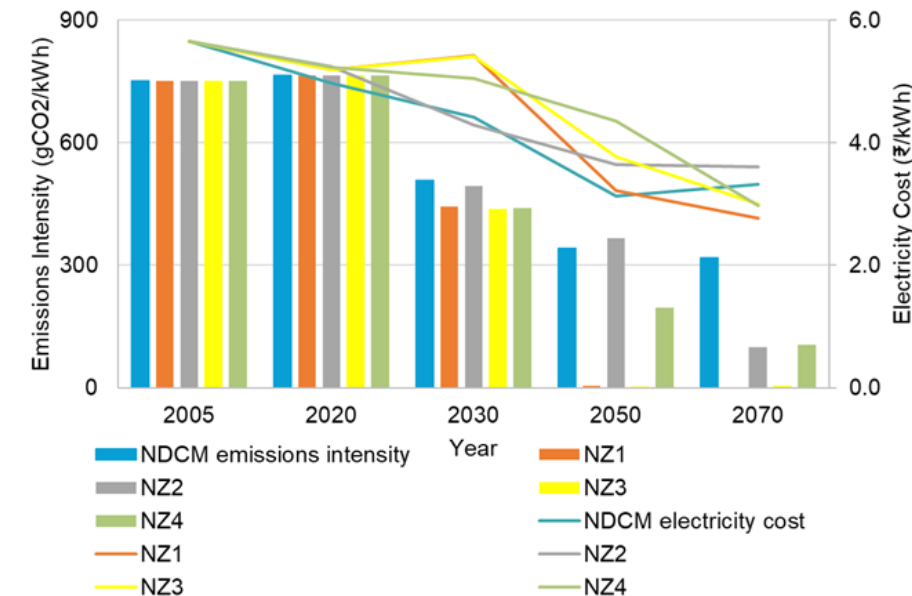
Socio- Economic Parameters

Defining Development

India - Development Aspirations and Energy needs

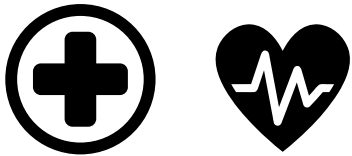
- India aspires to be a **developed country by 2047**.
- There has always been a priority for energy as well as climate security, however energy and basic service need to be affordable and accessible.
- IIMA conducted a study on synchronizing energy transitions towards NZ 2070
 - **Model:** Techno-economic energy-land-water model
 - **Electricity sector** hard-linked with buildings, transport, agriculture, industry, land
 - **Services:** Buildings, Transport, Agriculture, Industry
 - **Seven scenarios** developed
 - **Three scenarios** based on economic growth (low, medium, high)
 - **Four based on Net Zero** (CCUS, Nuclear, renewables, Integrat

Under NZ scenarios, the emission intensity of electricity generation decreases to around **1–105 gCO₂/kWh** from the current **766 gm/kWh**, along with a substantial reduction in Levelized Cost of Electricity (LCOE).



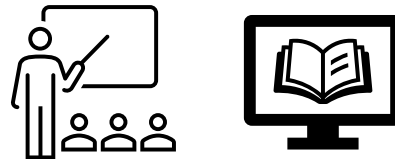
What is Human Development Index (HDI)?

- Beyond GDP
- Focus on human welfare
- HDI integrates social and economic aspects



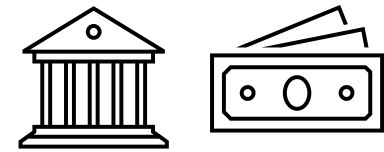
Health

(Life expectancy at birth)



Education

(Expected and mean years of schooling)



Standard of Living Economic well-being

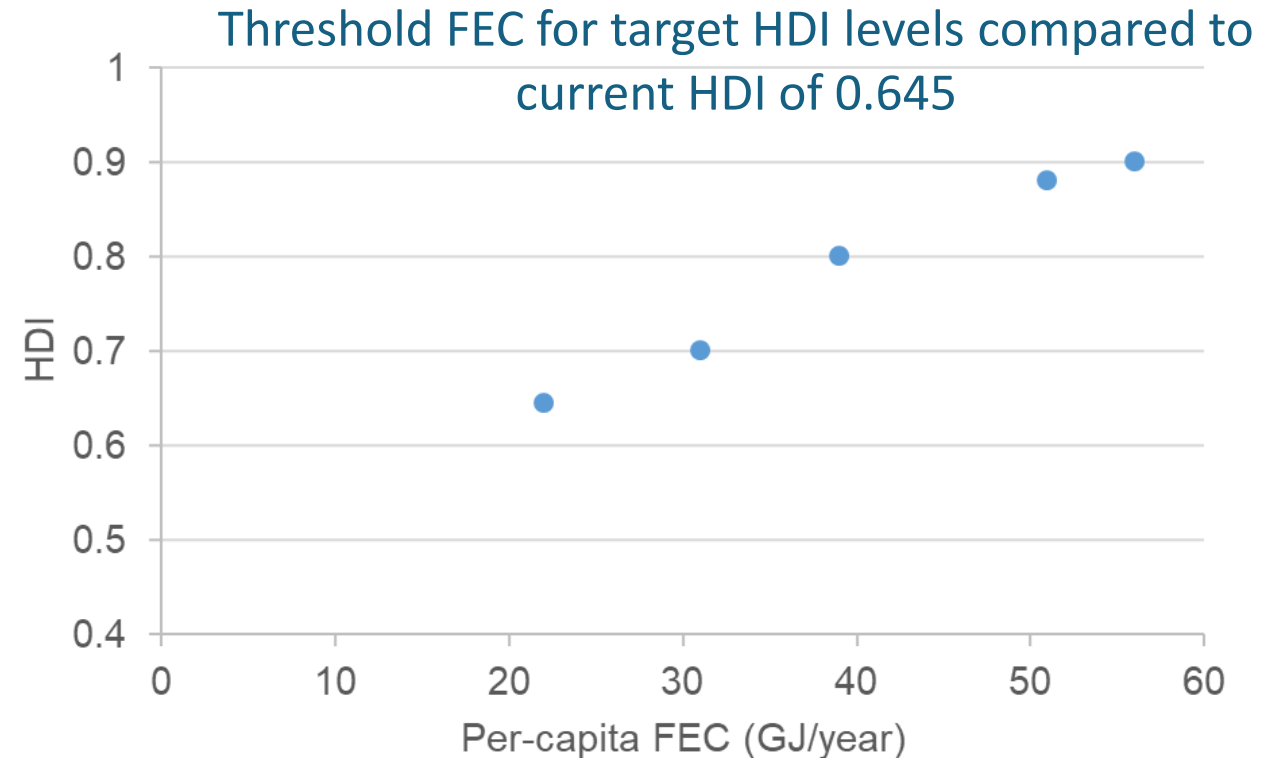
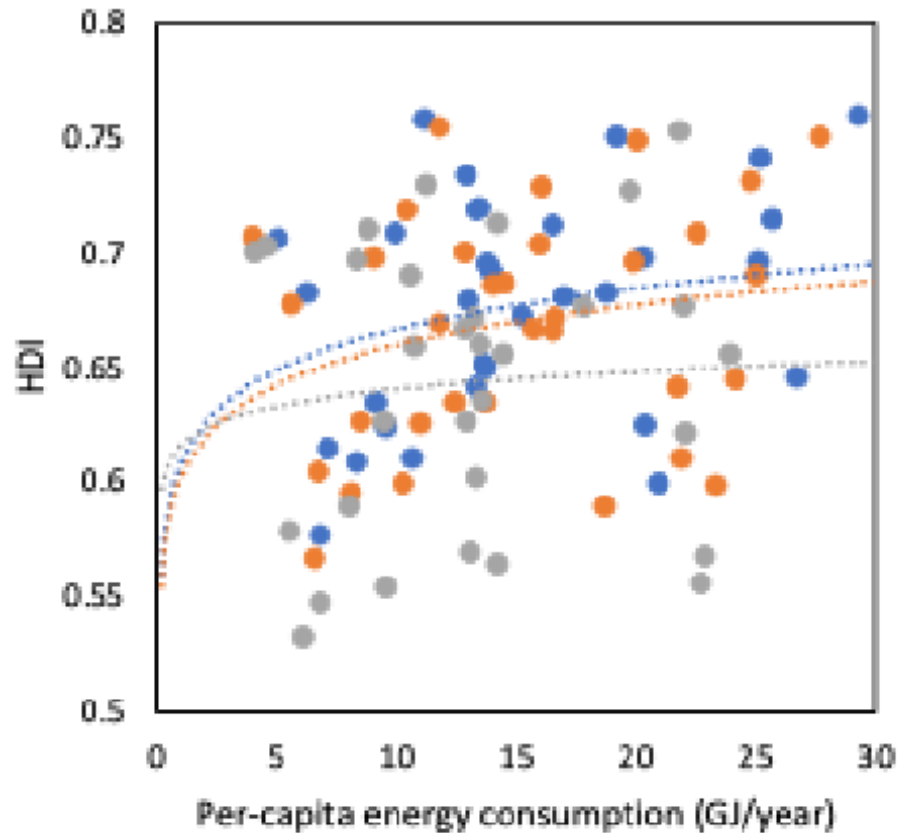
(Gross National Income per capita)

- Limitations
 - Does not directly measure social, gender inequality
 - Does not include environment
 - Does not include all sustainability variables

How much energy do we need to become a developed country?

4

- **2019**: India consumed avg. **21 GJ/capita/year** (2.4-91 across states) at **HDI of 0.645**



What can be achieved?

- **0.7 HDI at 31 GJ/capita/year**
- **0.8 HDI at 39 GJ/capita/year**
- **0.9 HDI at 56 GJ/capita/year**

Source: Garg et al. 2024; Singh, U., et al 2026 (Working Paper) and Vishwanathan, S.S. et al. 2026 (Working Paper)

Decent Living Standards (DLS)

Based on concepts of **poverty** and **basic justice**

- Basic needs approaches (Doyal and Gough 1991; Max-Neef et al. 1991; Wiggins 1998)
- Capabilities approach (Nussbaum 2000; Sen 1987, 1993)

Essential Components:



Housing - Safe, adequate shelter



Water & Sanitation - Clean water access



Food - Nutritious meals



Healthcare - Medical access



Education - Primary & secondary



Energy - Electricity & heating



Transportation - Safe mobility



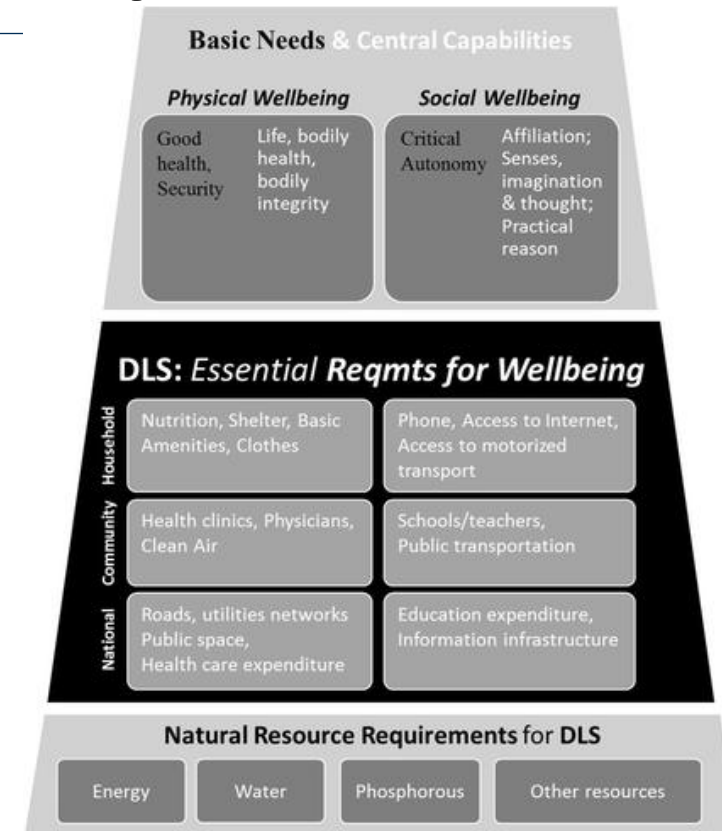
Communication - Phone/internet access



Employment - Safe working conditions



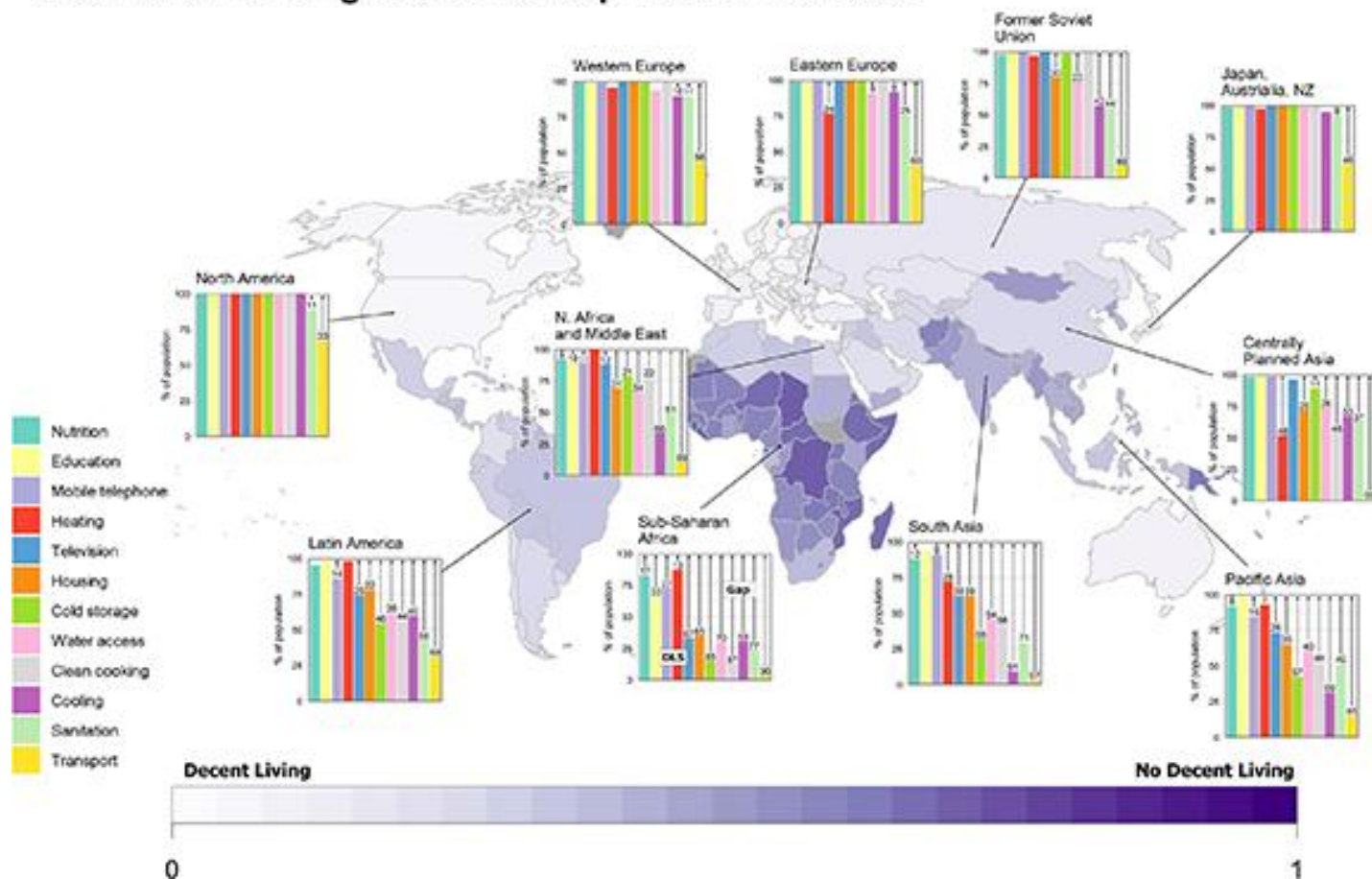
Social Inclusion - Community participation



JUSTMIP - Decent Living Standards (DLS)

5

Mean decent living standards deprivation indicator



On average, over **60% of the population** does not meet DLS thresholds for more than half of the decent living indicators

Highest shares of population living below DLS are found in sub-Saharan African countries

Education gap estimates are:
 33% for sub-Saharan Africa,
 6% for South Asia
 10% for North Africa and the Middle East

Nutrition gap estimates are:
 17% for sub-Saharan Africa
 12% for South Asia
 8% for North Africa and the Middle East

Source: Kirkstra et al. 2021

To summarize...

5

Aspects	GDP	HDI	DLS
Nature	Economic	Social aspects included	Basic needs and poverty
Focus	Production output	Human welfare	Essential needs
Metric	Monetary	Index (0-1)	Threshold/Minimum requirements
SDG	SDG 8	SDG 3, SDG 4, SDG 8	SDG 1, SDG2, SDG 3, SDG 4, , SDG 6, SDG97 SDG 8, SDG9, SDG 10, SDG 11, SDG 12, SDG 15
Inequality	Not included	Not included	Social equality, gender equality not included
Inequity	Not included	Not included	Development aspirations at different income levels, cultural aspects, not included
Planetary Boundary	Not included	Not included	Certain aspects included
Governance	Not included	Not included	Not included

6

NEWPATHWAYS: Expression of Interest

Designing New

Development Focussed Socio-economic Projections (DSPs)

NEW 
PATHWAYS



Funded by
the European Union

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Expression of Interest in DSPs

Objective: to support the use of **development focused socio-economic projections (DSPs)** as input for a new set of global mitigation pathways.

We welcome collaboration with research teams that:

- **Development-led:** *Narratives and quantitative* trajectories are grounded in regionally articulated development objectives and aspirations, explicitly incorporating distributional, justice, and equity considerations.
- **Globally consistent:** *National trajectories* remain coherent when aggregated to the global level and are compatible with macroeconomic constraints and international linkages.
- **Policy-relevant and usable:** *Outputs* are provided in formats, with documentation and quality checks, that enable straightforward uptake by IAM teams and other users.
- **Transparent and reproducible:** *Assumptions*, model configurations, and data sources are fully traceable and made openly accessible.

Submission by

end of 2027

- Narrative
- Quantitative



Access the full

**Expression of
Interest**

**Thank you for your
time and patience!**

Please contact for further information

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