The transition from multi-crisis towards Sustainability

If you can't measure it, you can't manage it, and you can’t improve it!

Professor Phoebe Koundouri

Athens University of Economics and Business (AUEB) and Technical University of Denmark (DTU)

Director ATHENA Information Technologies RC

Chair UN SDSN Global Climate Hub and European Hub, Chair AE4RIA

Member World Academy of Art & Science, European Academy of Science, European Academy of Science Technology

President European Association of Environmental and Resource Economists

President World Council of Environmental and Resource Economists

ΟΙΚΟΝΟΜΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS

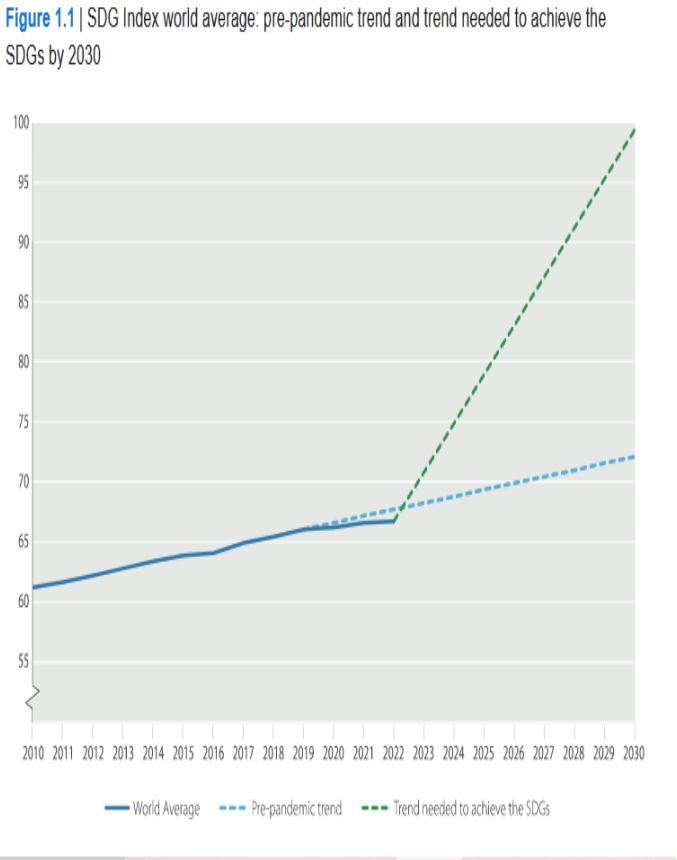
DTU Technical University of Denmark

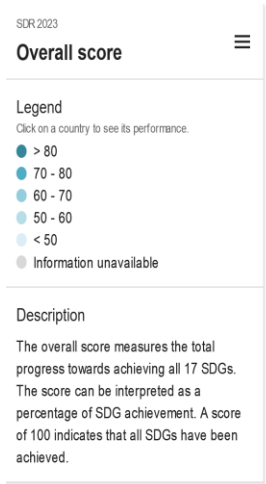
ATHENA Research & Innovation Information Technologies

SUSTAINABLE DEVELOPMENT SOLUTIONS NETWORK
A GLOBAL INITIATIVE FOR THE UNITED NATIONS

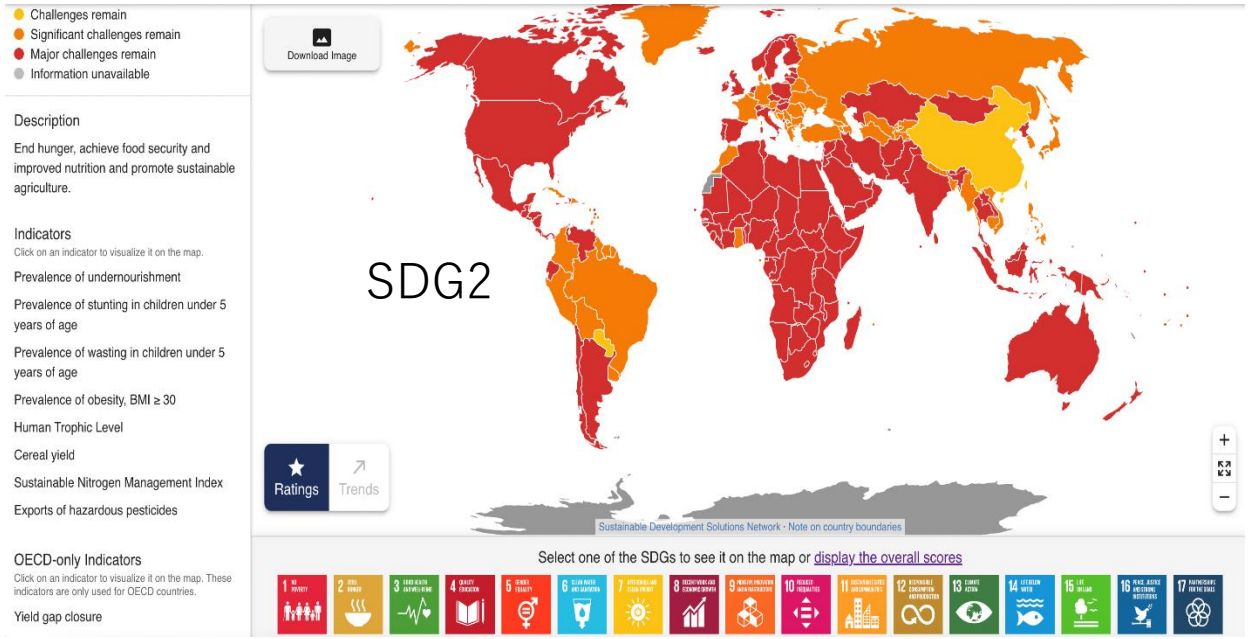
Measuring Sustainability

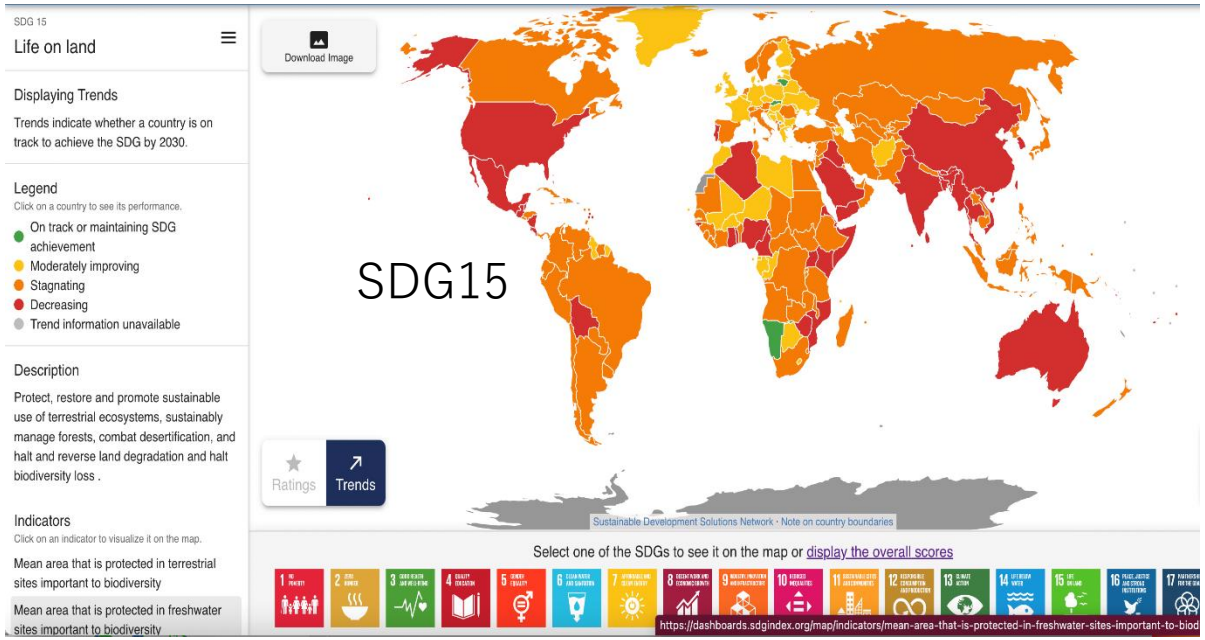
If you can't measure it, you can't manage it, and you can’t improve it!

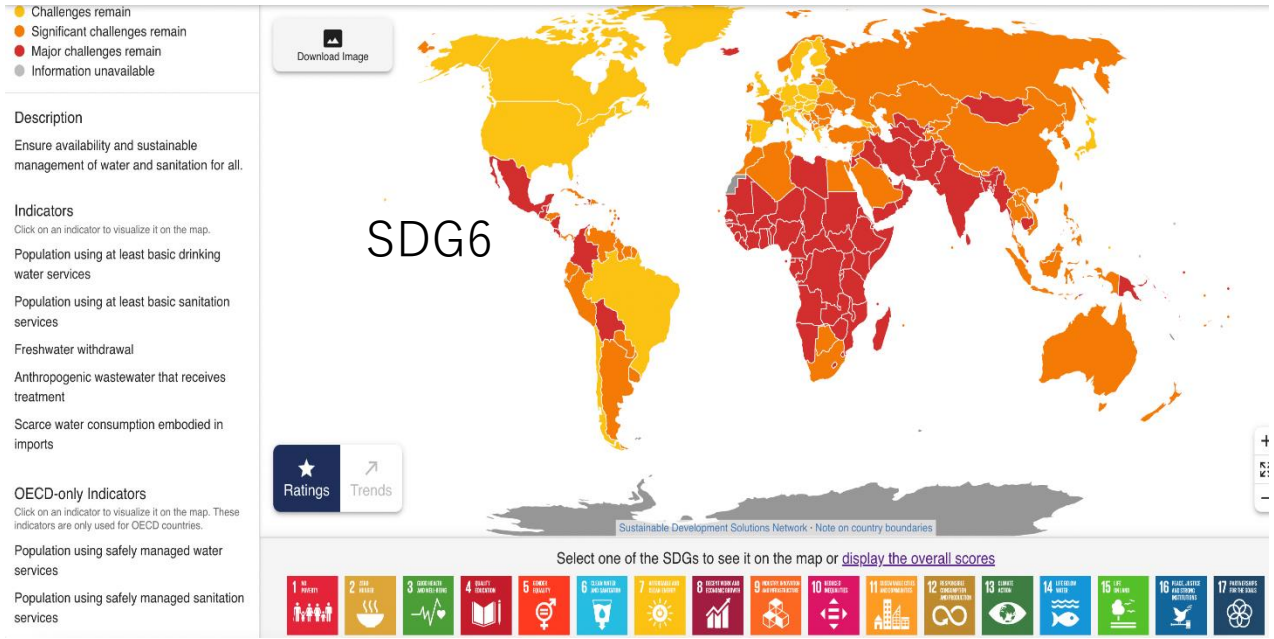


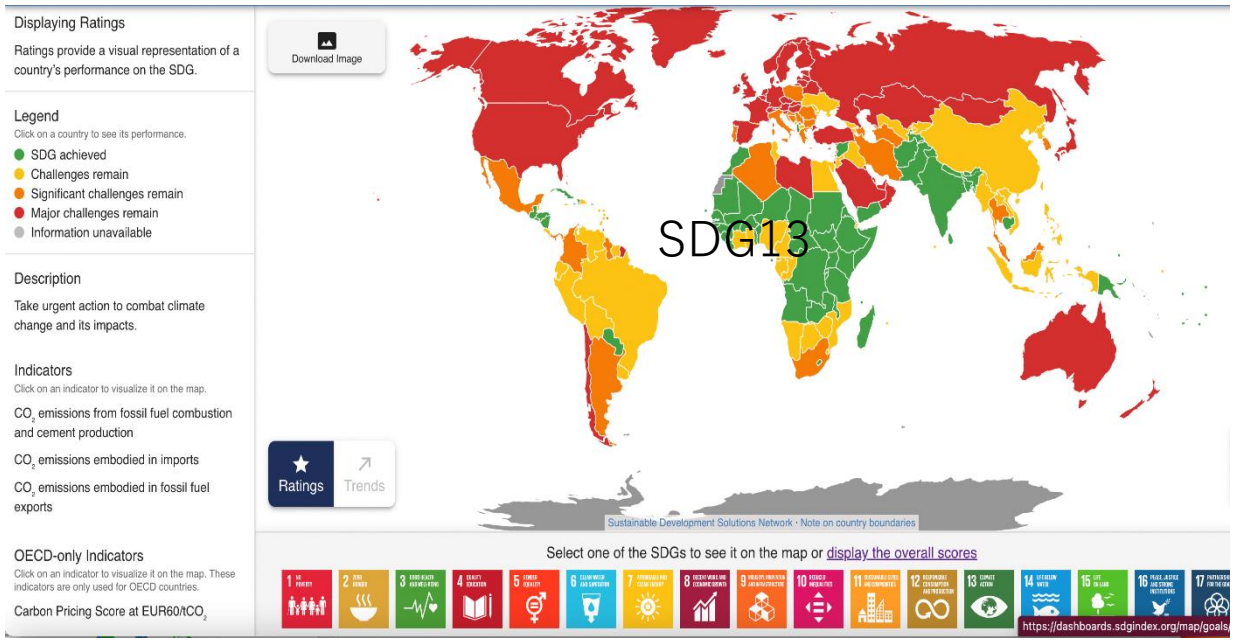



2 ZERO HUNGER
7 AFFORDABLE AND CLEAN ENERGY
6 CLEAN WATER AND SANITATION


Challenges remain
Significant challenges remain
Major challenges remain
Information unavailable
Description
End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
Indicators
Click on an indicator to visualize it on the map.
Prevalence of undernourishment
Prevalence of stunting in children under 5 years of age
Prevalence of wasting in children under 5 years of age
Prevalence of obesity, BMI ≥ 30
Human Trophic Level
Cereal yield
Sustainable Nitrogen Management Index
Exports of hazardous pesticides
OECD-only Indicators
Click on an indicator to visualize it on the map. These indicators are only used for OECD countries.
Yield gap closure
Download Image
SDG2
Ratings
Trends
Sustainable Development Solutions Network · Note on country boundaries
Select one of the SDGs to see it on the map or display the overall scores


SDG 15
Life on land
Displaying Trends
Trends indicate whether a country is on track to achieve the SDG by 2030.
Legend
Click on a country to see its performance.
On track or maintaining SDG achievement
Moderately improving
Stagnating
Decreasing
Trend information unavailable
Description
Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss .
Indicators
Click on an indicator to visualize it on the map.
Mean area that is protected in terrestrial sites important to biodiversity
Mean area that is protected in freshwater sites important to biodiversity
Download Image
SDG15
Ratings
Trends
Sustainable Development Solutions Network · Note on country boundaries
Select one of the SDGs to see it on the map or display the overall scores
https://dashboards.sdgindex.org/map/indicators/mean-area-that-is-protected-in-freshwater-sites-important-to-biod


Challenges remain
Significant challenges remain
Major challenges remain
Information unavailable
Description
Ensure availability and sustainable management of water and sanitation for all.
Indicators
Click on an indicator to visualize it on the map.
Population using at least basic drinking water services
Population using at least basic sanitation services
Freshwater withdrawal
Anthropogenic wastewater that receives treatment
Scarce water consumption embodied in imports
OECD-only Indicators
Click on an indicator to visualize it on the map. These indicators are only used for OECD countries.
Population using safely managed water services
Population using safely managed sanitation services
Download Image
SDG6
Ratings
Trends
Sustainable Development Solutions Network · Note on country boundaries
Select one of the SDGs to see it on the map or display the overall scores


Displaying Ratings
Ratings provide a visual representation of a country's performance on the SDG.
Legend
Click on a country to see its performance.
SDG achieved
Challenges remain
Significant challenges remain
Major challenges remain
Information unavailable
Description
Take urgent action to combat climate change and its impacts.
Indicators
Click on an indicator to visualize it on the map.
CO_2 emissions from fossil fuel combustion and cement production
CO_2 emissions embodied in imports
CO_2 emissions embodied in fossil fuel exports
OECD-only Indicators
Click on an indicator to visualize it on the map. These indicators are only used for OECD countries.
Carbon Pricing Score at EUR60/tCO_2
Download Image
SDG13
Ratings
Trends
Sustainable Development Solutions Network · Note on country boundaries
Select one of the SDGs to see it on the map or display the overall scores
https://dashboards.sdgindex.org/map/goals/

UN SDSN Global Climate Hub

https://unsdsn.globalclimatehub.org

SUSTAINABLE DEVELOPMENT SOLUTIONS NETWORK
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Global Climate Hub

ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS

ATHENA Research & Innovation Information Technologies

ACADEMY OF ATHENS

In collaboration with national governments and respective SDSN National Hubs (2000 institutions globally) we *co-design national and sub-national pathways for the transition to a* ***climate neutral and resilient*** *world.*

Optimal Dynamic Mixture of Technologies, Policies, Fiscal & Financial Instruments

- Climate Data Platforms and Digital Applications
- Atmospheric Physics and Climatology
- Climate & Energy Modeling
- Climate, Land Use, Water-Food-Energy-Biodiversity Nexus Modeling
- Climate and Health
- Innovation Acceleration for Climate Neutrality and Resilience
- Just Transition: Policies, Finance, Labor Market
- Transformative Participatory Approaches: National Living Labs and Systems Innovation
- Education, Training, Upskilling and Reskilling

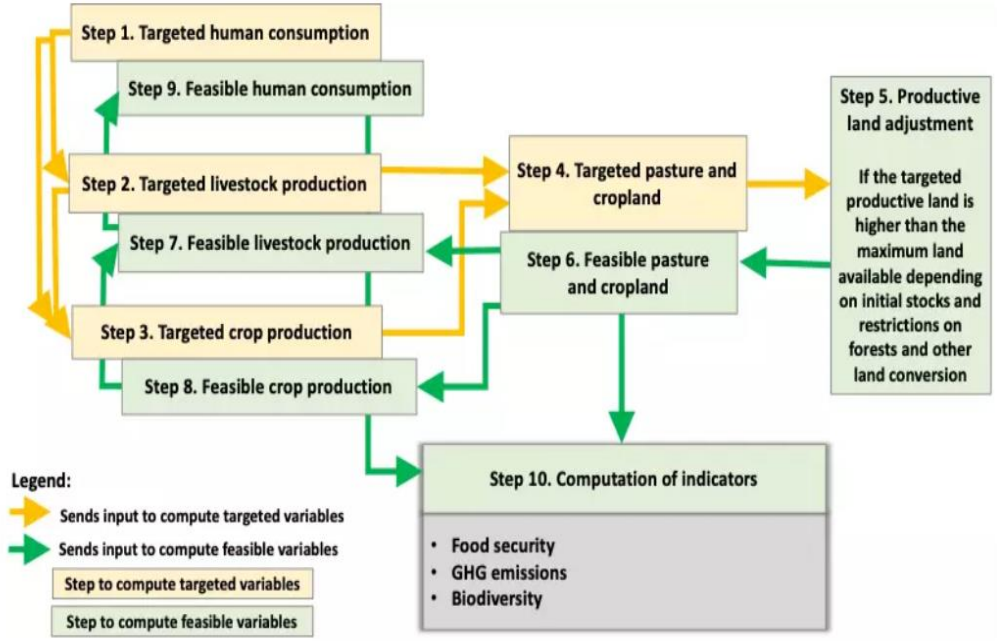
Team

Climate, Land Use, Water-Food-Energy-Biodiversity Nexus Modeling

The **FABLE Calculator** is :

an accounting tool used to study the potential evolution of food and land-use systems over the period 2000-2050.

It focuses on agriculture as the main driver of land-use change and tests the impact of different policies and changes in the drivers of these systems through the combination of a large number of scenarios.



Supporting Projects

Land Use Sustainable Pathway: In Need of an IPFSS Report!

> 1 billion Combination of Scenarios → Pathways

- **Current Trends**
- **National Commitments**
- **Global Targets**

Shifting diets, increasing crop and livestock productivity, and limiting agricultural land expansion, are the strongest drivers of positive change in global biodiversity.

Implementing these reforms in multiple countries would help put us on track to achieve global biodiversity, food security and climate mitigation goals by 2050.

S.1 — GDP projections

SELECTION	GDP_SCEN	DESCRIPTION	GDP variation 2000-2050
x	SSP1	"*Sustainability*" - Medium high speed of economic growth for most advanced countries and high speed of convergence for other countries.	2.4
	SSP2	"*Middle of the Road*" - Medium speed of economic growth for most advanced countries and medium speed of convergence for other countries.	2.2
	SSP3	"*Fragmentation*" - Low speed of economic growth for most advanced countries and low speed of convergence for other countries.	1.1

S.13 — Choose the level of activity of the population

SELECTION	ActivityScen	DESCRIPTION	Value
x	Low	Refers to sedentary lifestyle that includes only the physical activity of independent living.	
	Middle	Moderately active lifestyle that includes physical activity equivalent to walking about 1.5 to 3 miles per day at 3 to 4 miles per hour, in addition to the activities of independent living.	
	High	Active lifestyle that includes physical activity equivalent to walking more than 3 miles per day at 3 to 4 miles per hour, in addition to the activities of independent living.	

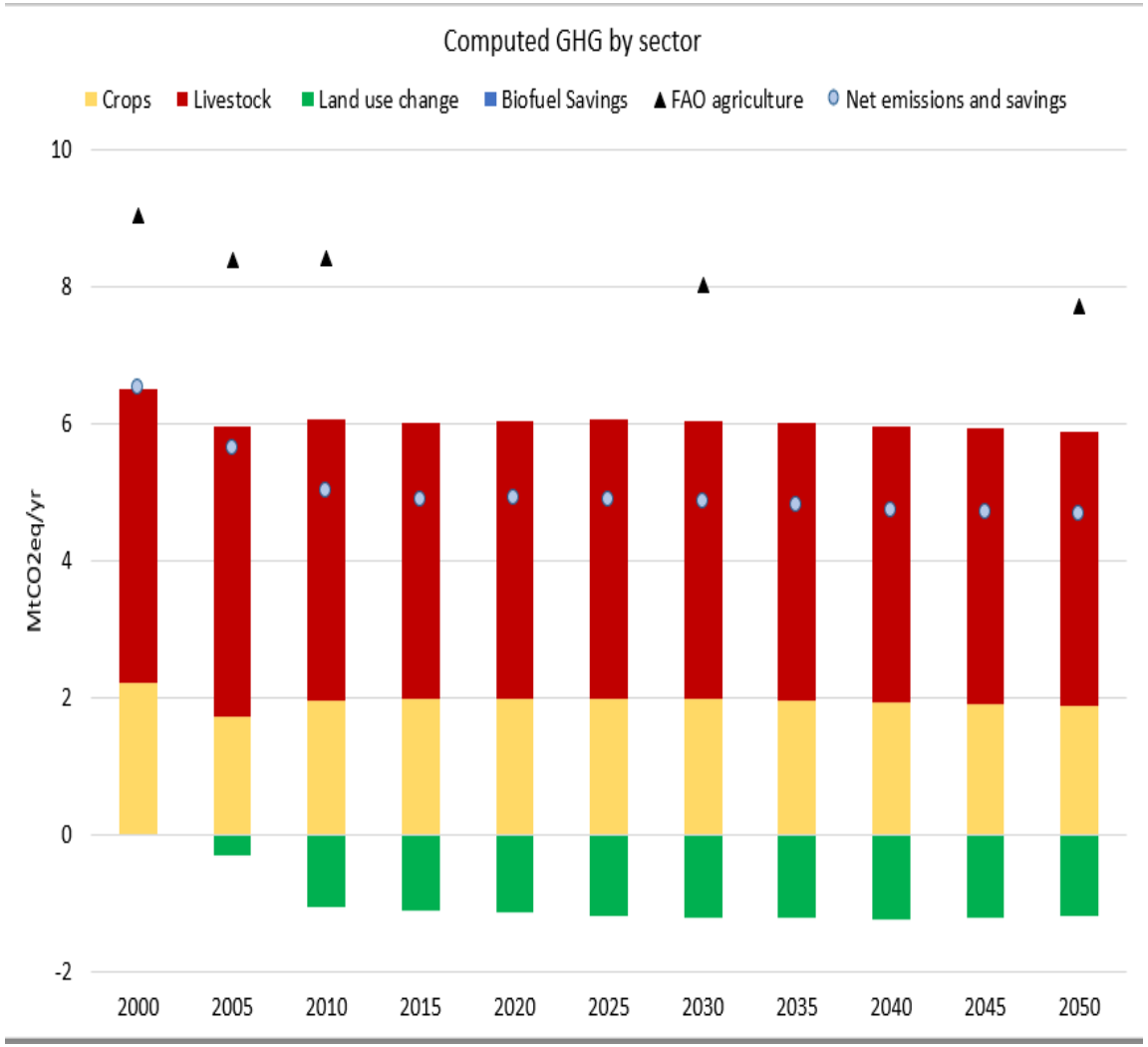
S.10 — Alternative scenarios on afforestation target

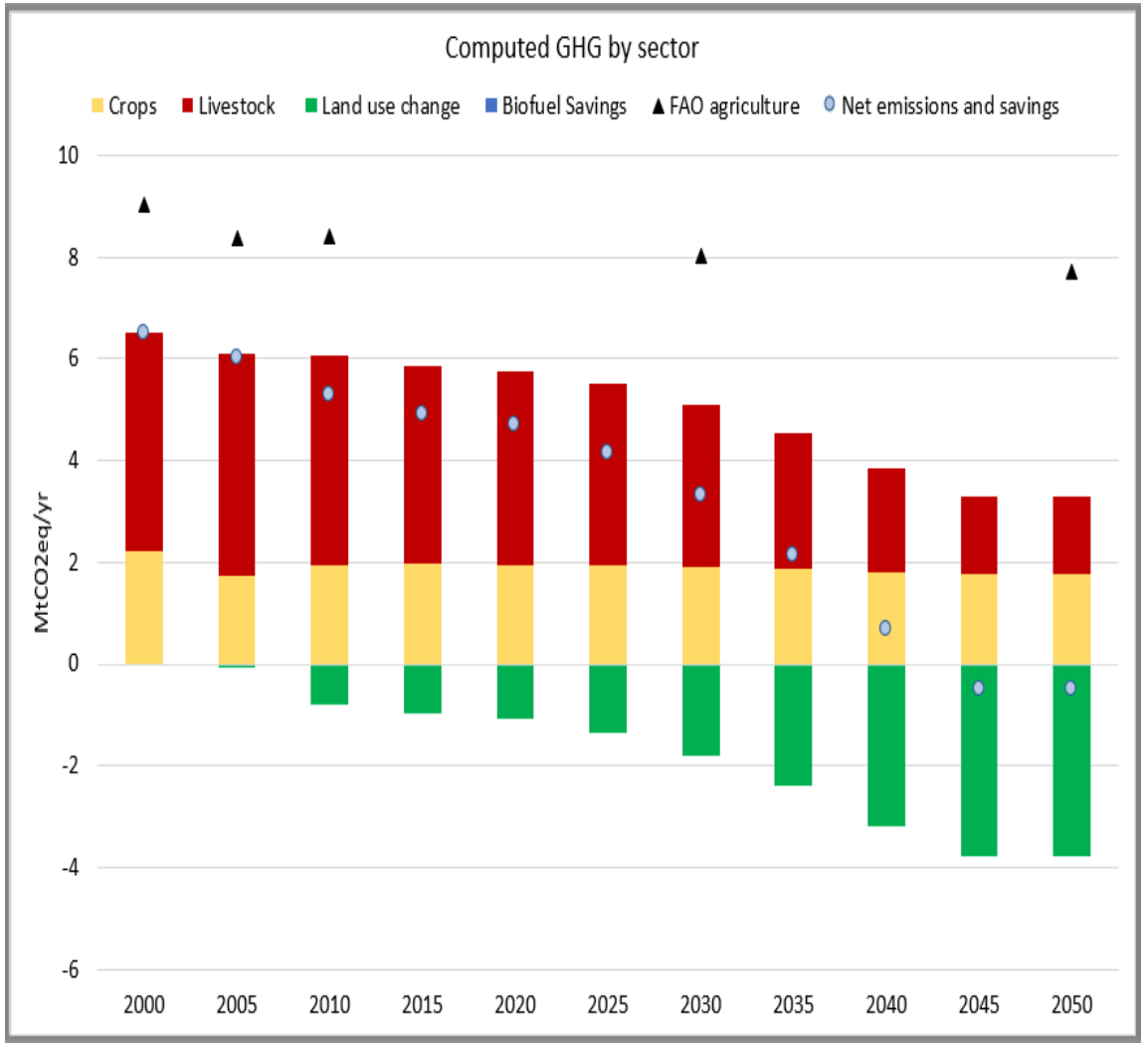
SELECTION	AFFOR_scen	DESCRIPTION	Value
	NoAffor	No afforestation/reforestation target	Define the afforestation target by 2050 for both scenarios in the green cells of S.10a: AfforTarget
X	BonnChallenge	Afforestation/reforestation target in line with Bonn Challenge commitment	

S.3 — Diet

SELECTION	DIET_SCEN	DESCRIPTION	Value
	SSP1	"*Sustainability*" - Future diets are considered to be more sustainable. First, to reflect the better management of domestic waste in developed countries, consumption per capita is in the regions assumed almost constant. Second, animal protein demand is reduced in regions and increases in developing ones to reflect diversification of diets, but keeping the consumption of red meat relatively low. For developing regions, more nutritious diets also materialize through a reduction of consumption in root and tubers.	Countries converge to 3300 kcal/cap/d. If animal conso > 75 g prot./cap/day, reduction to that level. If anim conso < 25 g prot./cap/day, increase to that level. Red meat decreased or capped at 5 g prot./cap/day for all. Root conso decreases in poor countries to 300 kcal/cap/day and is replaced by other products.
	SSP2	"*Middle of the Road*" - These future diets follow the projections from FAO at the horizon 2050.	
	SSP3	"*Fragmentation*" - as economic growth is much lower in developing region, the income effects alone leads to a significantly lower demand per capita in these regions	
	NoChange	same diet as in 2010	
x	EATLancetAverage	EAT-Lancet recommended diet (average values per food group)	
	FatDiet	Diet high in fat, sugar, and meat	
	MyDiet	Describe your scenario here	If you want to design your own diet scenario, enter the targeted kcal/cap/day per food group by 2050 in the green cells in S.3.c: DietTarget

Decline in GHG Emissions by 2050 - GREECE





water futures

HOME PROJECT CONCEPT OBJECTIVES NEWS PUBLICATIONS TEAM CONTACT

GET INVOLVED

Smart Water Futures

Designing the next generation of urban drinking water systems

Water-Futures answers the question: "How should the world achieve the provisioning of high-quality water services in the future while facing severe climate, economic and population pressures, under deep uncertainty?"

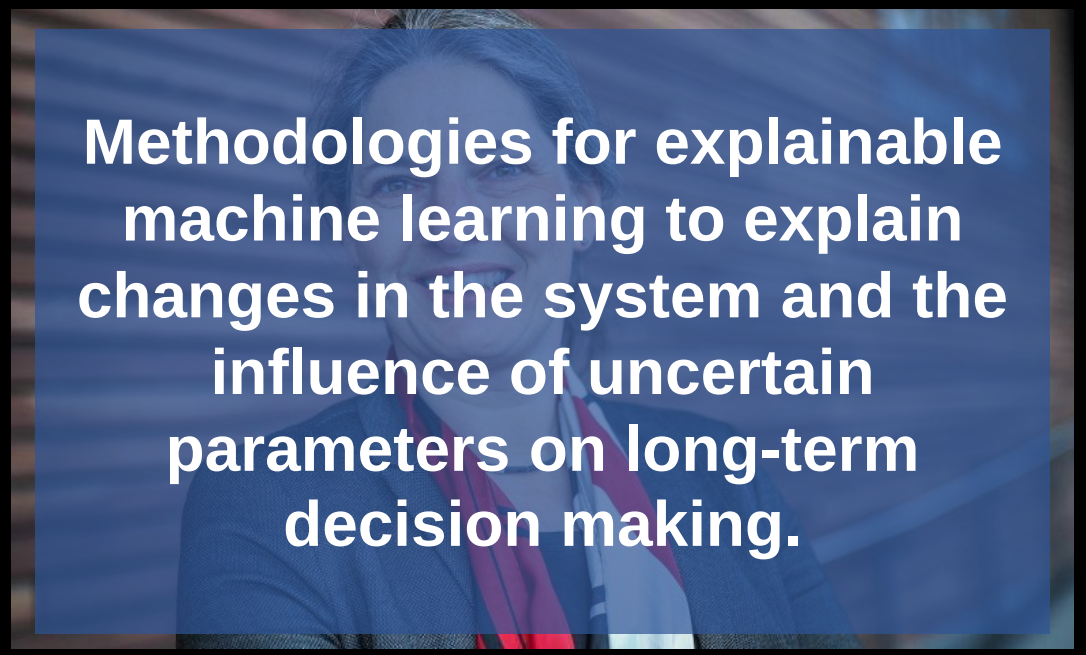
Why URBAN Water Systems?

Half of humanity – 3.5 billion people – lives in cities today and 5 billion people are projected to live in cities by 2030.

By 2050 70% of the world population is predicted to live in urban settlements.

Rapid urbanization is exerting pressure on fresh water supplies, sewage, the living environment, and public health.

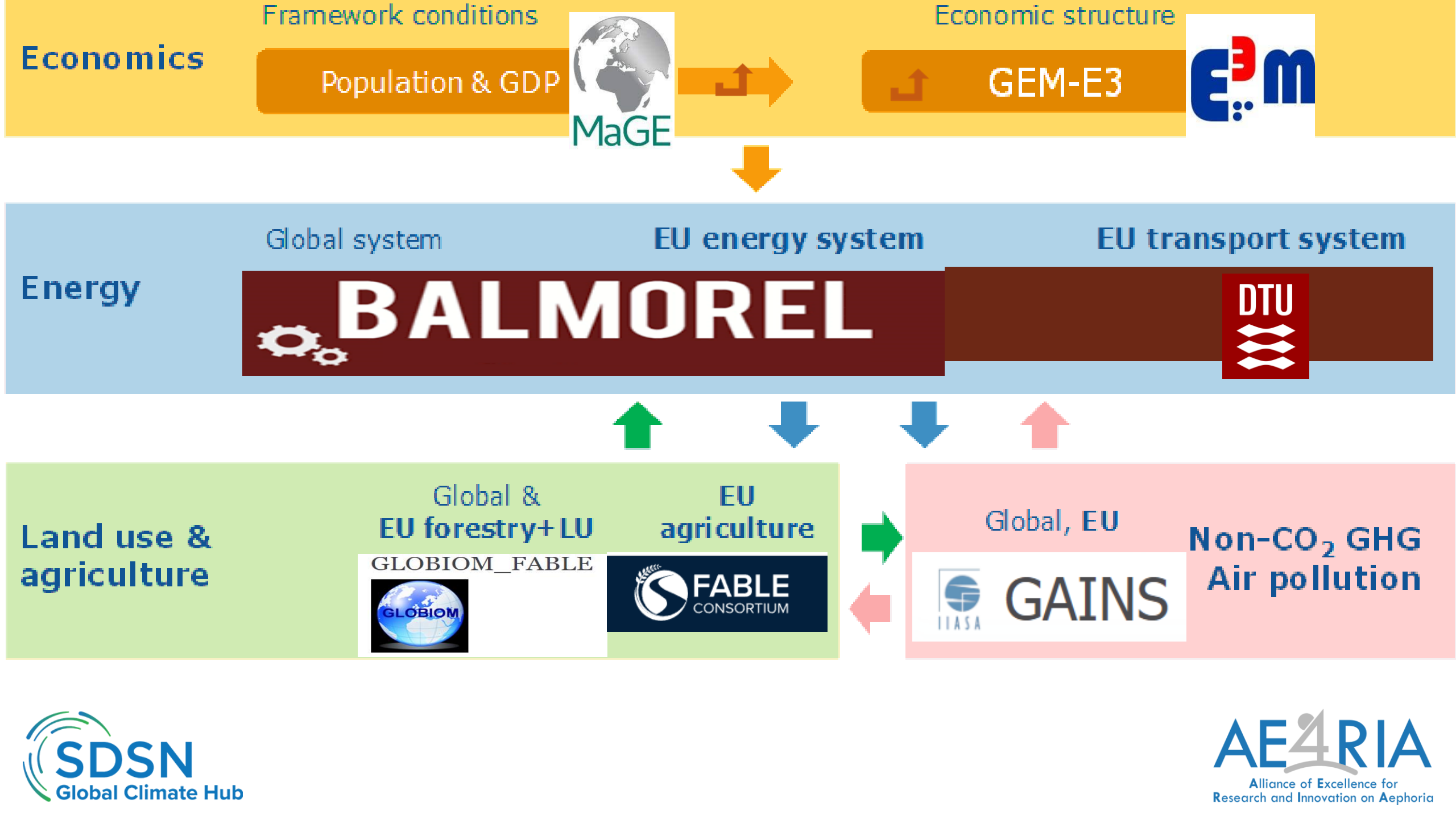
Methodologies for analysing decision-making under uncertainty and ambiguity, experimental behavioral science and including non-market economics valuation.



Methodologies for explainable machine learning to explain changes in the system and the influence of uncertain parameters on long-term decision making.

Methodologies for water infrastructure planning and management, valuing robustness and flexibility under deep uncertainties.

Methodologies for real-time monitoring and control for explainable fault diagnosis, and real-time risk assessment for both water quantity and quality.



SDSN Global Climate Hub

AE4RIA Alliance of Excellence for Research and Innovation on Aephoria

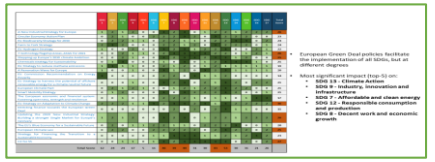
Just Transition: Policies, Finance, Labor Market

THE LANCET COVID-19 COMMISSION

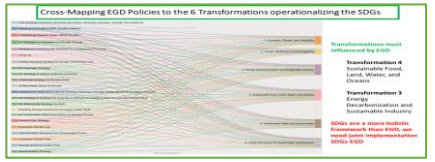
Key Sectors for Green Recovery

- Energy Sector - shift from fuels-based to minerals-based energy production, storage, and distribution system
- Agriculture and Food Sector - directly linked to the environment and the ecosystems
- Housing and Urbanization - Urbanization's growth should be managed sustainably
- Health Sector - invest COVID-19 recovery packages in strengthening health systems and increase regulation on risk-sources
- R&D for Geo-engineering - Removing CO2 from the atmosphere, blocking the sun, etc.

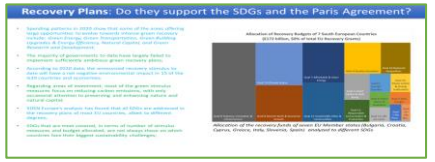
Machine Learning Textual Analysis
Does the EGD support the implementation of the SDGs?



Which of the 6 Sustainable Development Transformations are supported by the EGD?



Are the European Recovery and Resilient Plans SDGs-compatible?



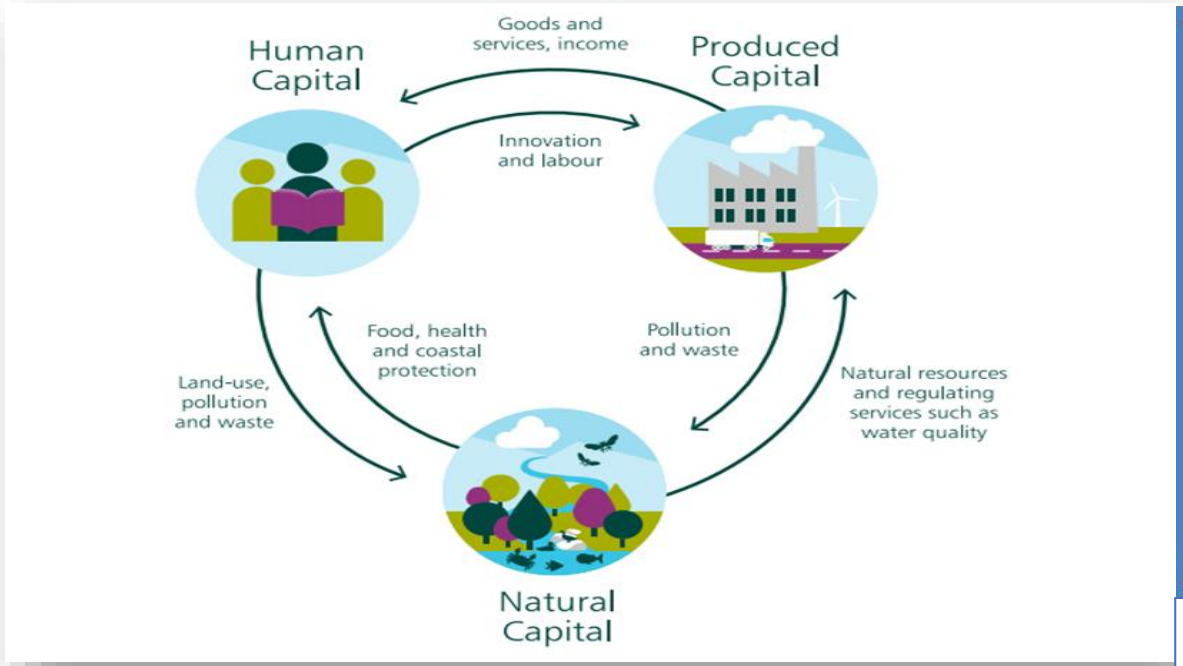
Does the European Semester Process facilitate the implementation of the SDGs?

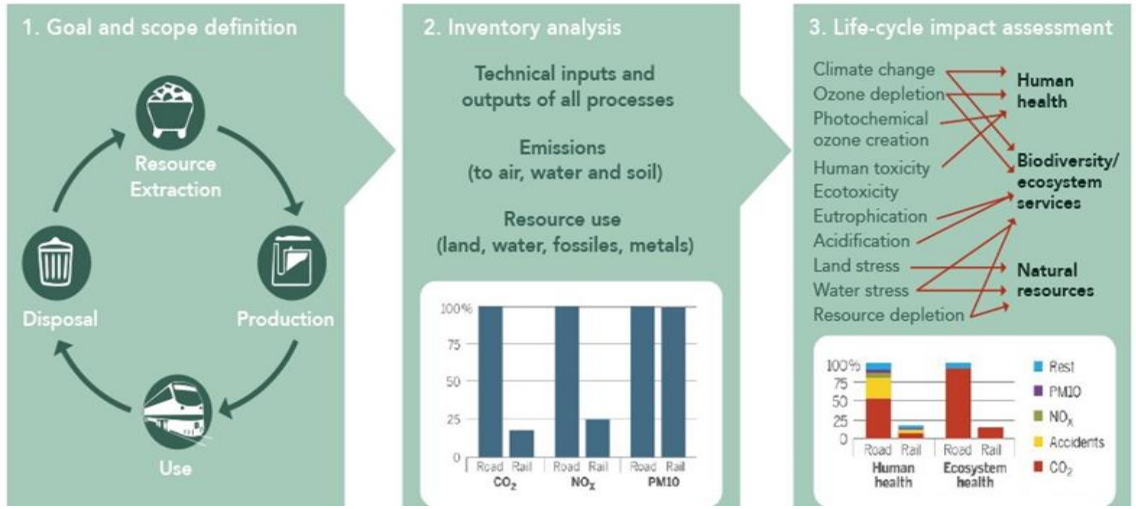
Sustainable Finance: Valuing Natural and Cultural Capital

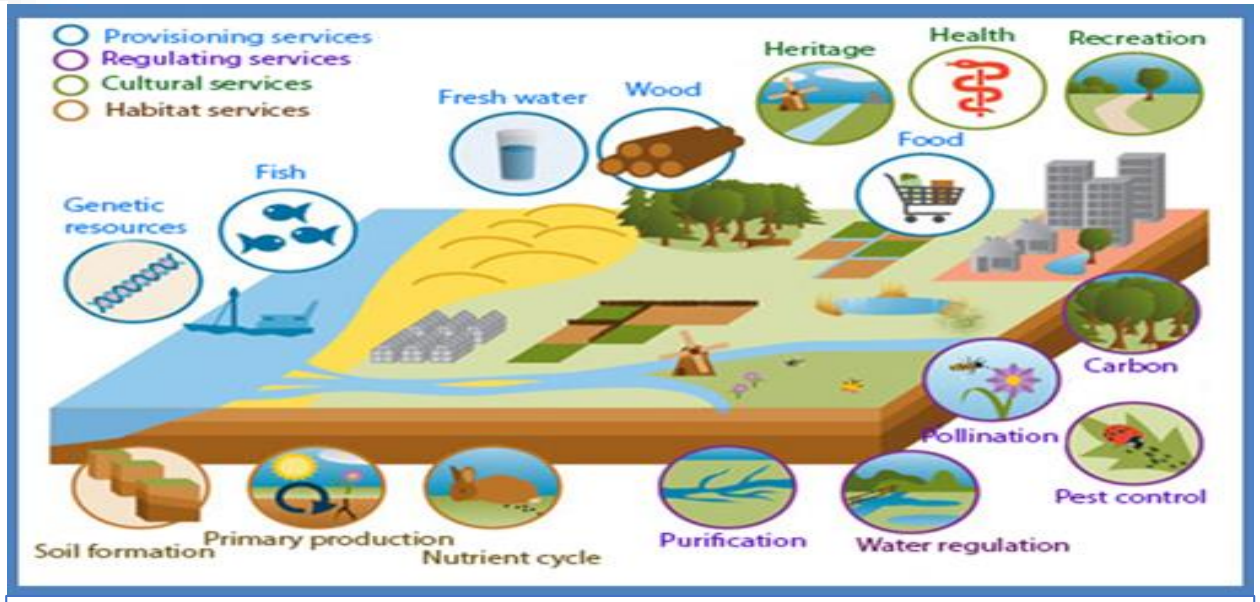
Fiscal Innovation: What are the distributional effects of Key EU climate policies?

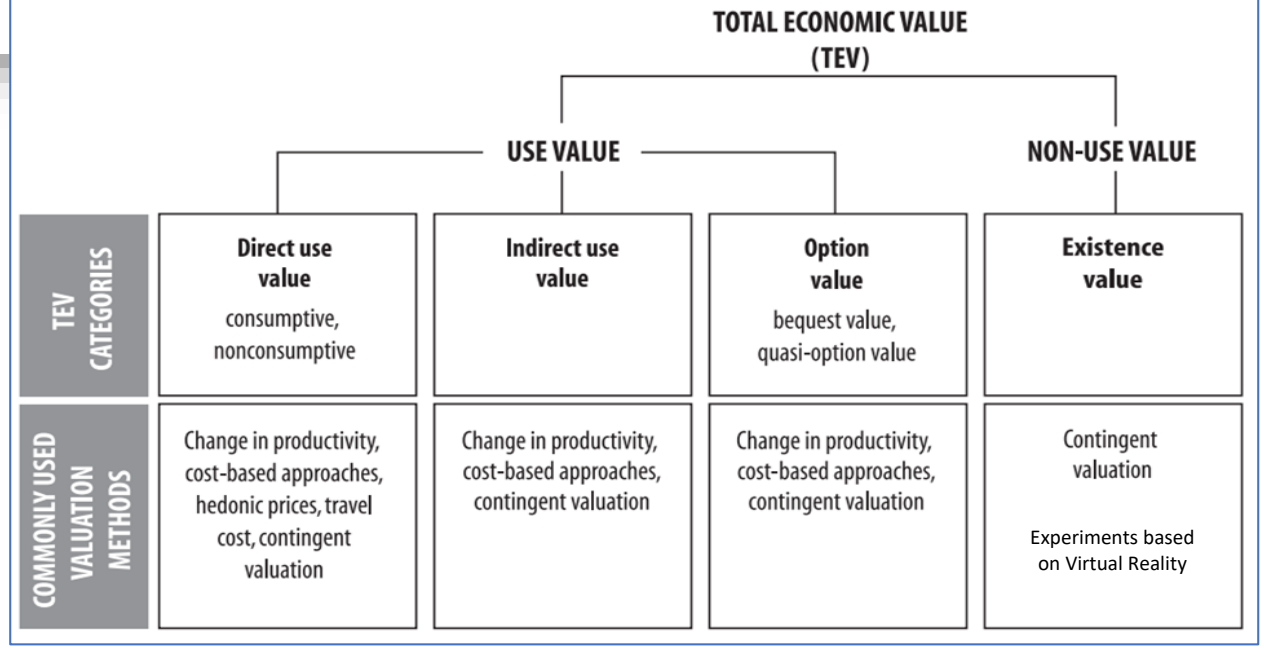
Sustainable Private Sector

Integrating Natural Capital in the Sustainable Finance Framework

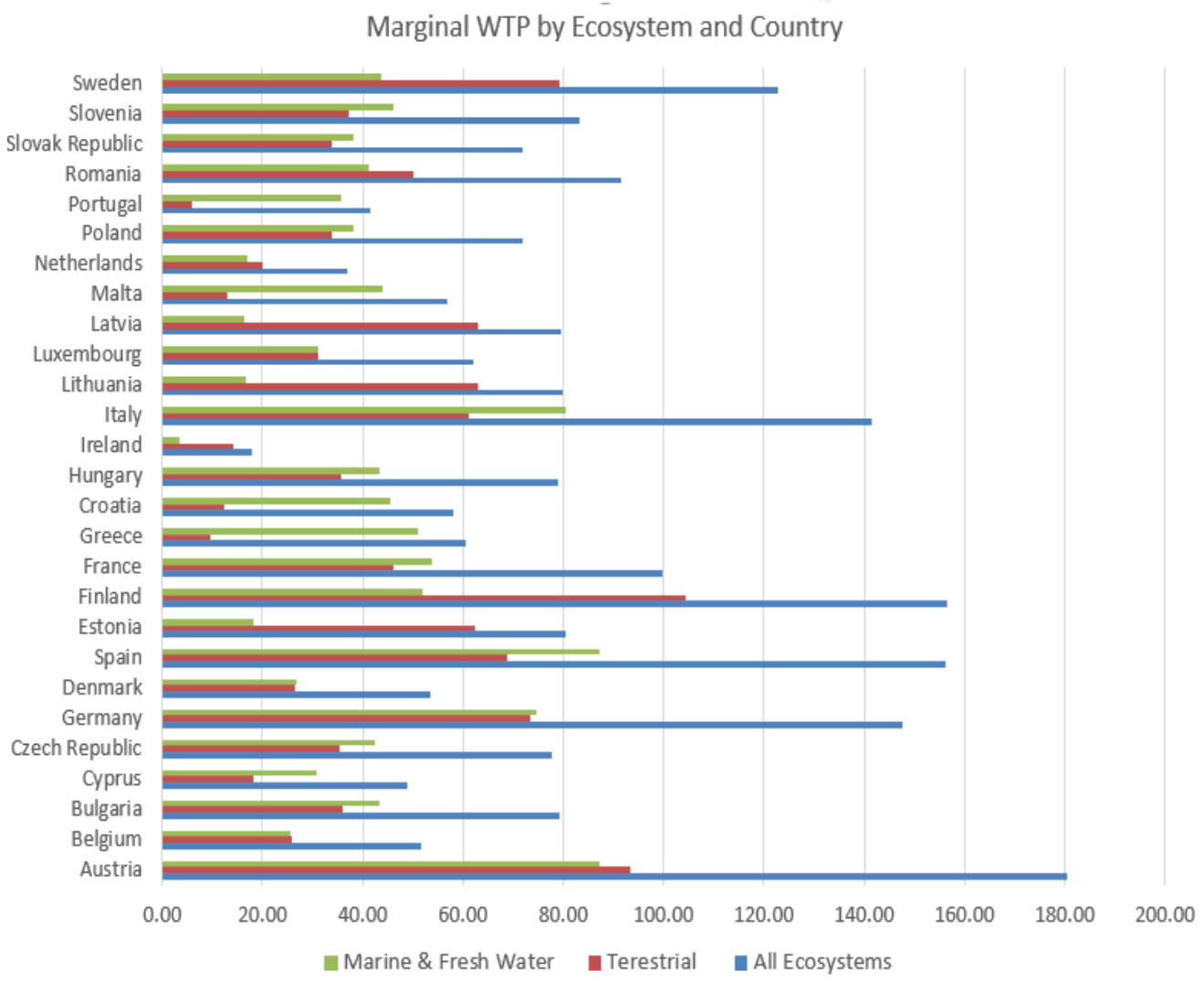


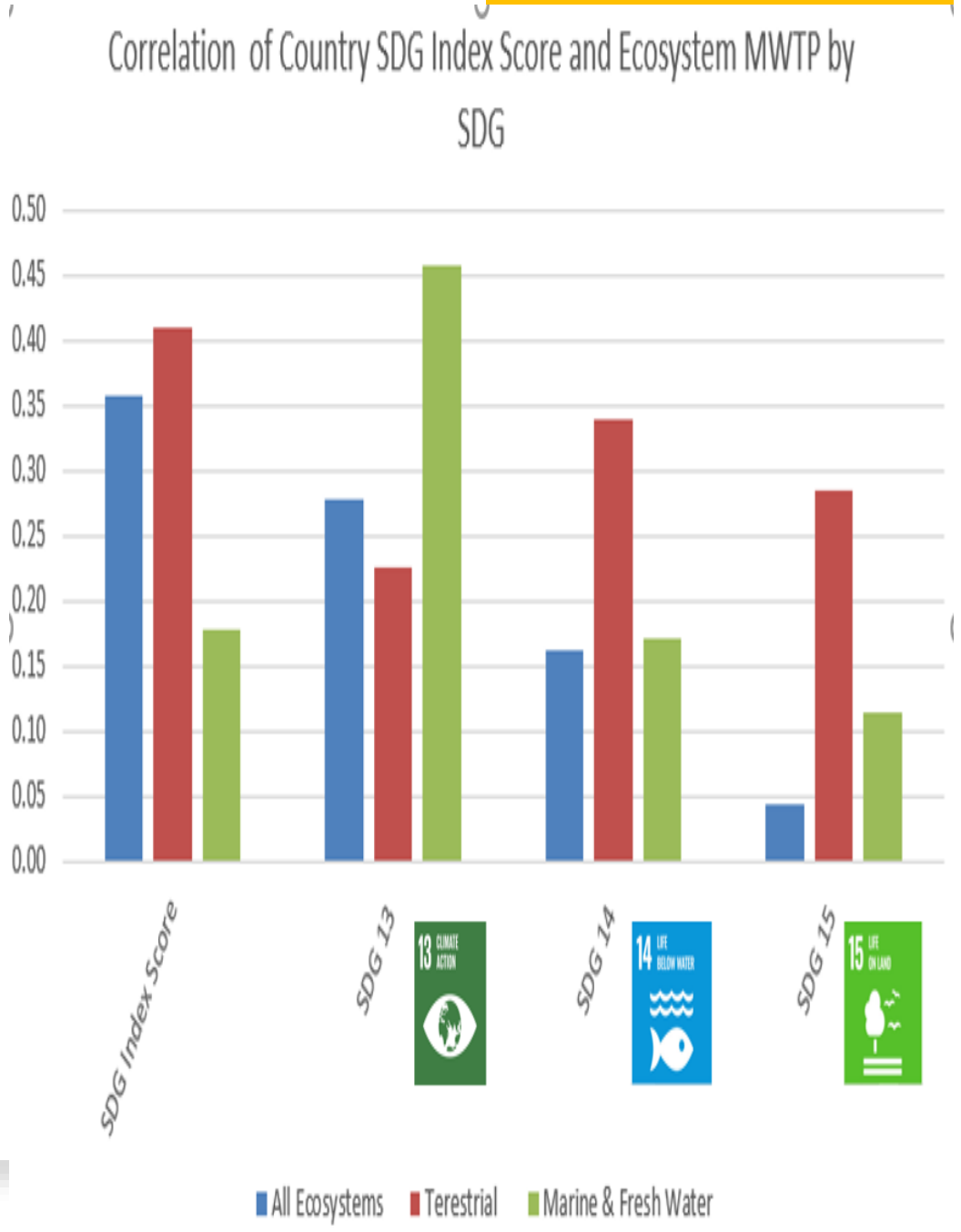






Open-Access, AI-based PLATFORM for Ecosystem and Cultural Services Valuation





The SDG Stimulus puts forward three areas for immediate action:

The impact of the current multi-crisis on developing countries is aggravated by an unfair global financial system that is short-term oriented and crisis-prone, and that further exacerbates inequalities.

UN SDGs Stimulus for Agenda 2030
Reform of the Global Financial Architecture, The Pontifical Academy of Social Sciences

1 Tackle the high cost of debt and rising risks of debt distress, including by converting short-term high interest borrowing into long-term (more than 30 year) debt at lower interest rates.

2 Massively scale up affordable long-term financing for development, especially through public development banks (PDBs), including multilateral development banks (MDBs), and by aligning all financing flows with the SDGs.

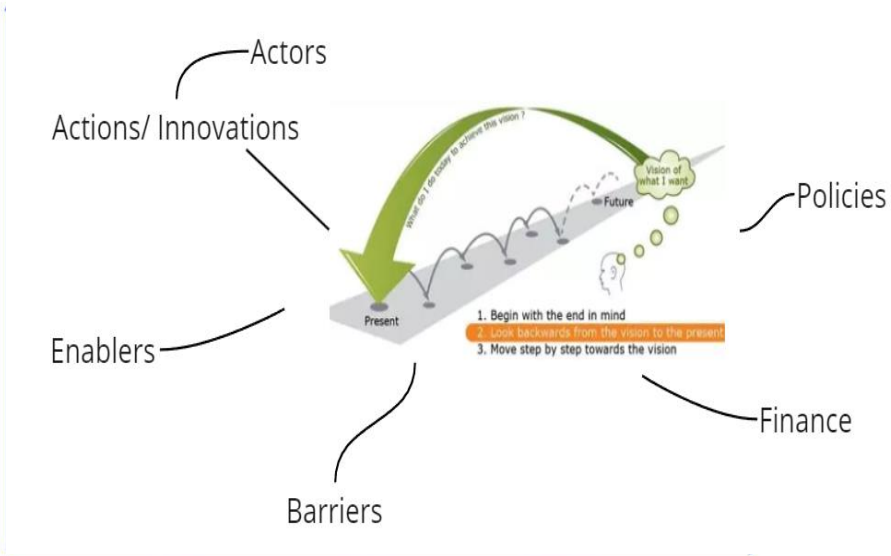
Transformative Participatory Approaches: National Living Labs and Systems Innovation

Head

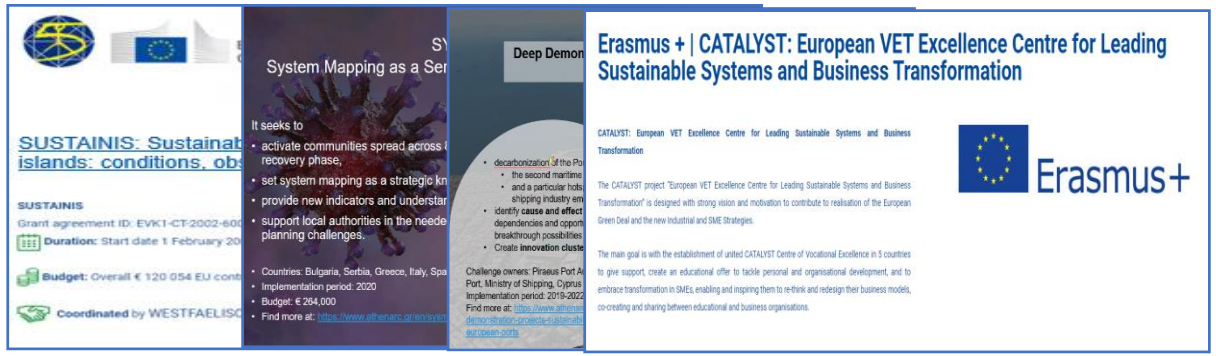
Team

Models can provide the evidence, but people must make the decisions…

Our transformative and participatory approaches seek to bridge the gap between science, policy and society, by supporting key actors to utilize model outputs to make sustainable decisions.



Supporting Projects



Methodologies

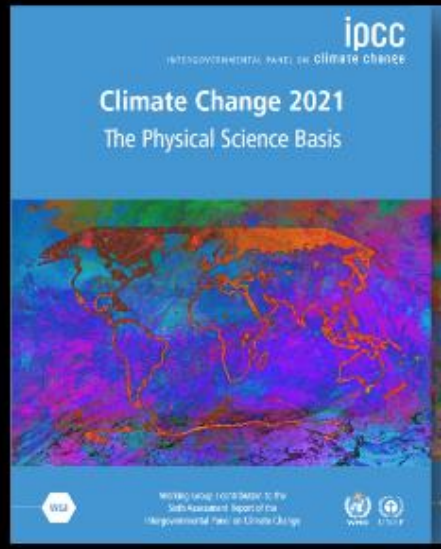
- Transformative Living Labs
- System Innovation and Transition Management
- Innovation Pathways
- Foresight methods such as Backcasting
- key actions and policy recommendations
- Living Lab Modeler Tool

The State of Knowledge about Climate Change

In need of IPFSS

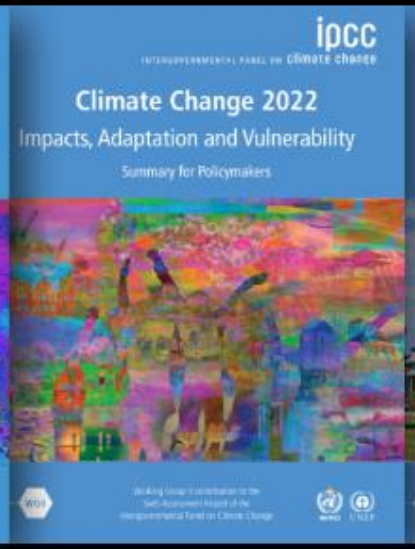
I!ntergovernmental Panel on Food Security and Sustainability

WGI



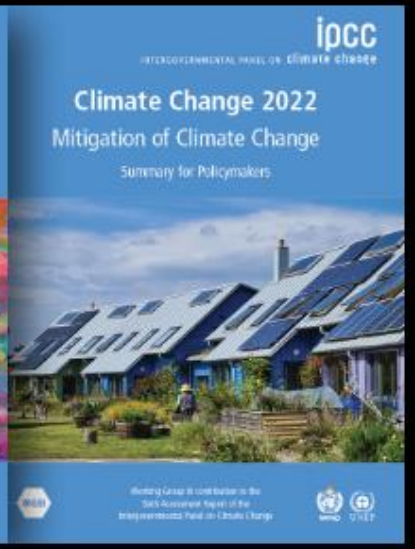
AR6 Climate Change 2021: The Physical Science Basis

WGII



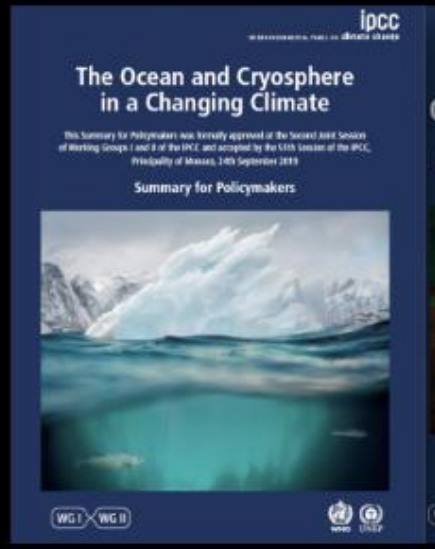
Climate Change 2022: Impacts, Adaptation and Vulnerability

WGIII



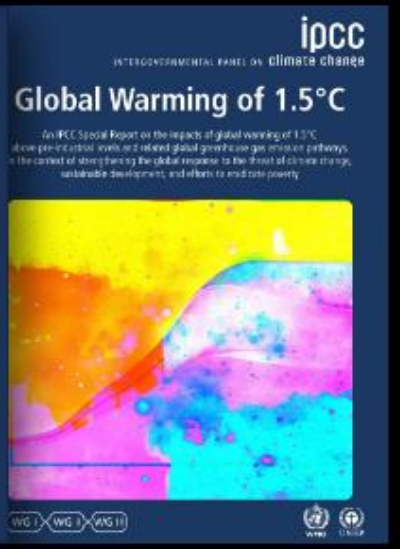
Climate Change 2022: Mitigation of Climate Change

Special Report



Ocean and Cryosphere in a Changing Climate

Climate Change and Land



Global Warming of 1.5 °C

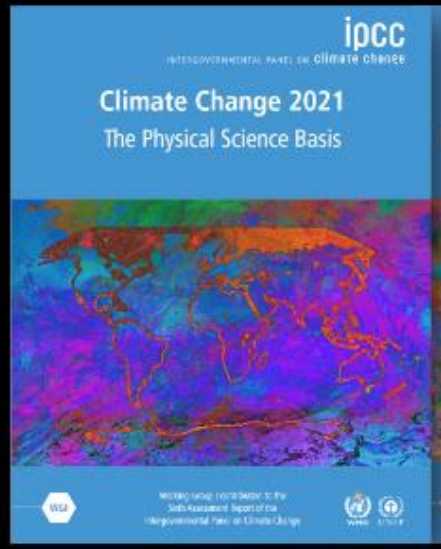
ipcc

The State of Knowledge about Climate Change

In need of IPFSS

I!ntergovernmental Panel on Food Security and Sustainability

WGI



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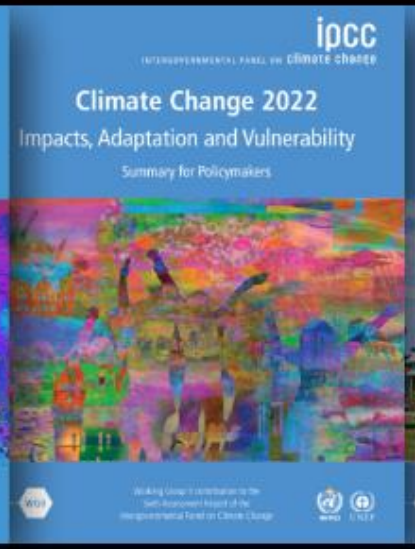

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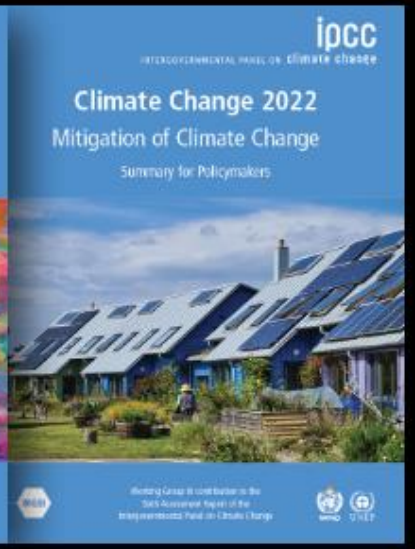
WGIII



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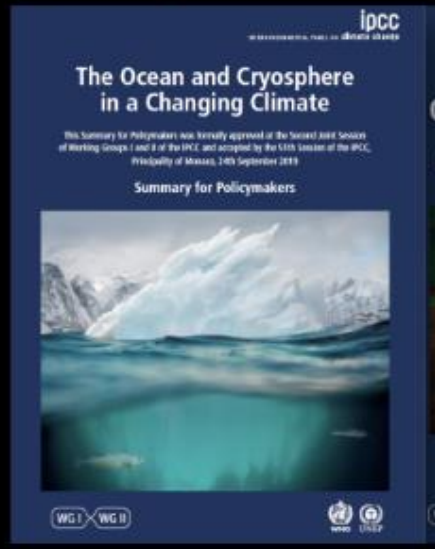

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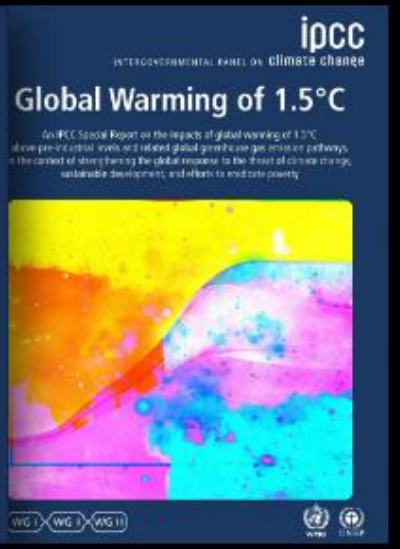

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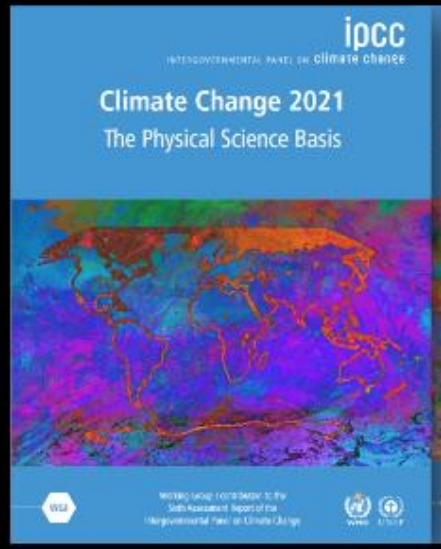

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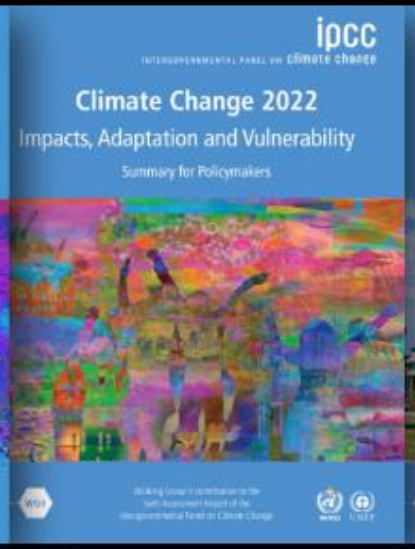
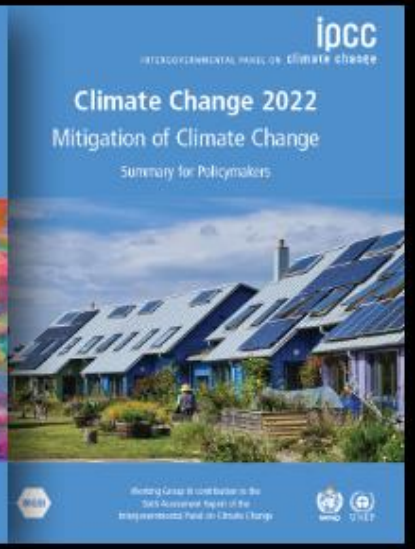


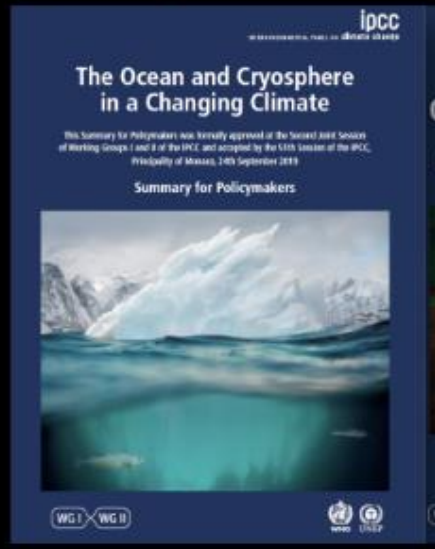
Climate Change 2022: Impacts, Adaptation and Vulnerability

WGIII



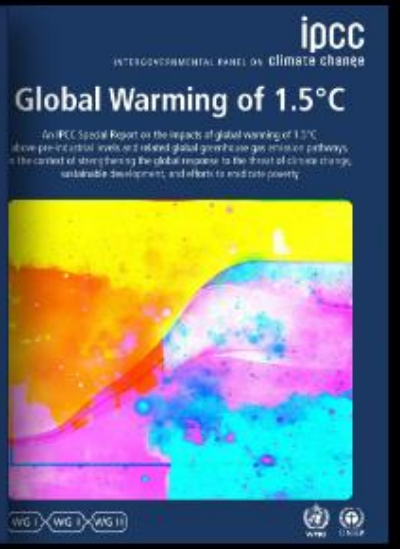
Climate Change 2022: Mitigation of Climate Change

Special Report



Ocean and Cryosphere in a Changing Climate

Climate Change and Land



Global Warming of 1.5 °C

ipcc