



Critical misalignments between climate action and sustainable development goals revealed

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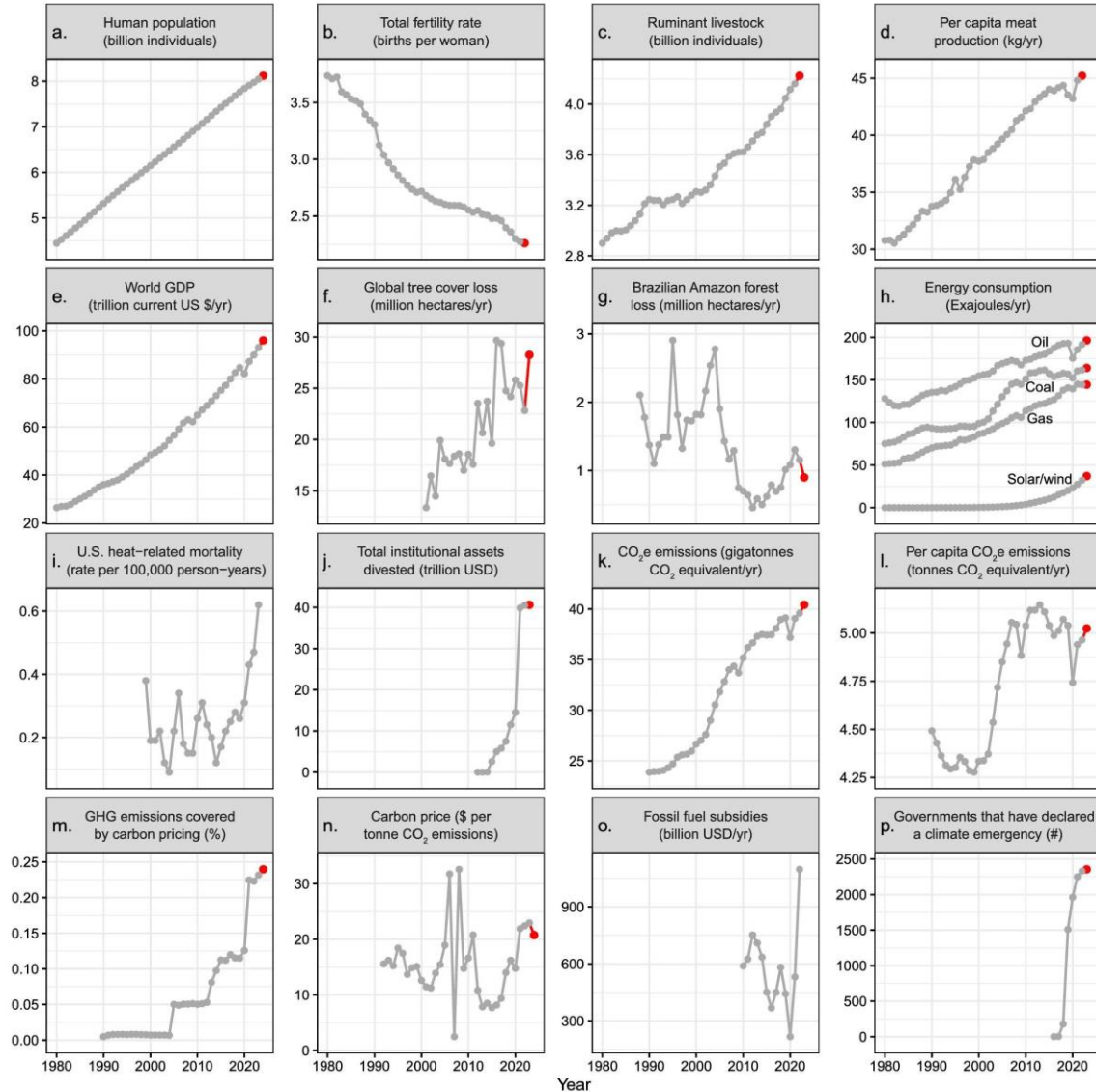
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The LIBRA project has received funding from the European Union's Horizon Europe research and innovation programme under the Marie Skłodowska-Curie grant agreement No. 101150729.

Rationale and contribution



The Sustainable Development Goals Report 2024



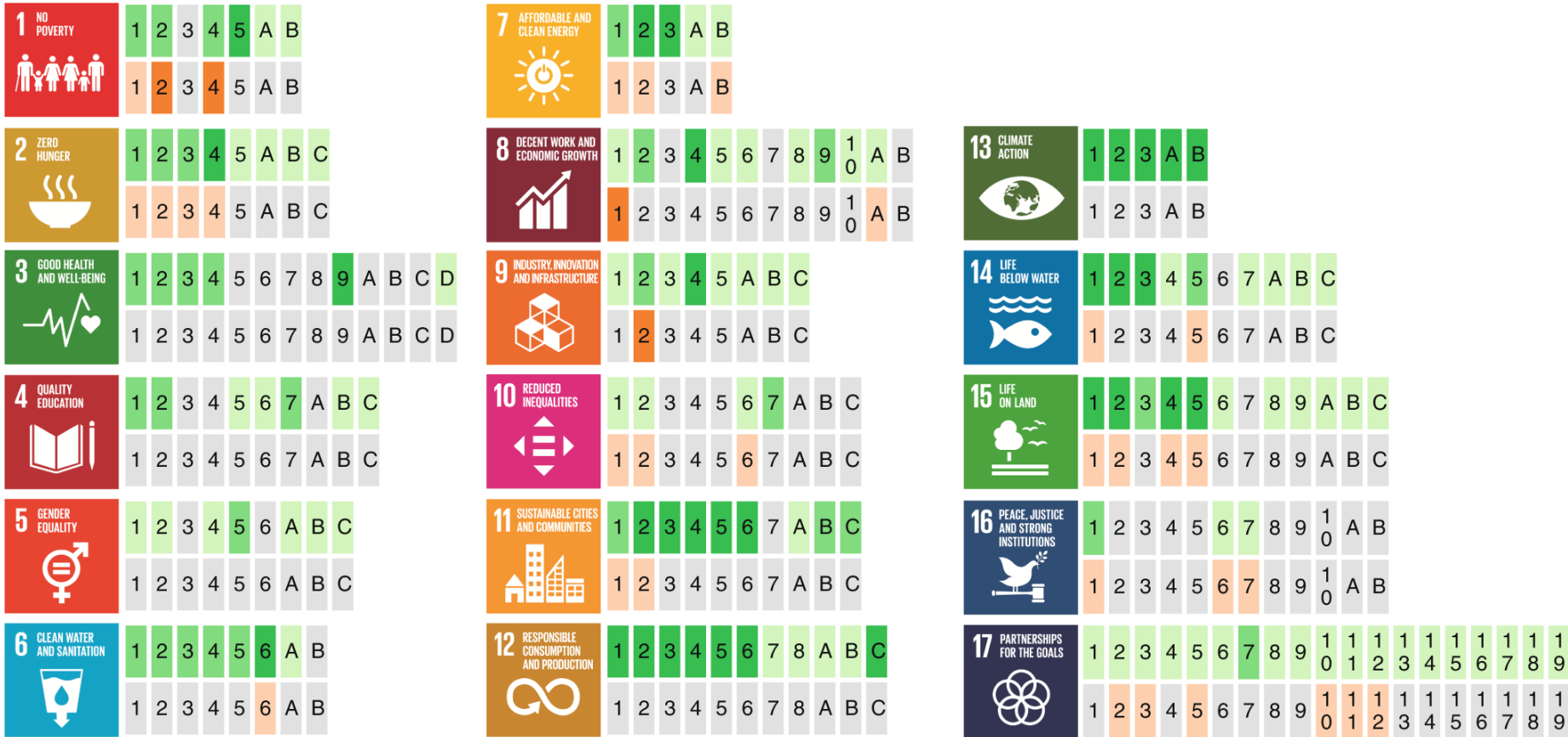
Only 17 per cent of the SDG targets are **on track**, nearly half are showing **minimal or moderate progress**, and progress on over one third has **stalled or even regressed**.

BioScience, biae087, <https://doi.org/10.1093/biosci/biae087>



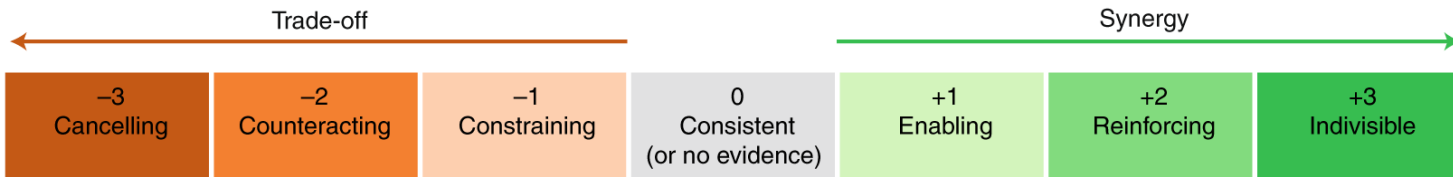
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Rationale and contribution



Expert-driven search for published studies in academic and 'grey literature'. Group members did not undertake a systematic review.

A single item of relevant published evidence was deemed sufficient to indicate an impact of climate change or synergies/trade-offs with climate action.



Fuso Nerini, F., Sovacool, B., Hughes, N. et al. Connecting climate action with other Sustainable Development Goals. *Nat Sustain* 2, 674–680 (2019). <https://doi.org/10.1038/s41893-019-0334-y>



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The importance of alignment

The context in and for which climate actions are designed affect the robustness of pledges (*Hoffer, R.E. in Starik et al., 2023*).

Political priorities change depending on needs, capabilities, resources and skills and the study of policy documents show short and medium sustainable development trajectories for the future.

Overarching goal of the paper

We aim at revealing whether climate political documents (i.e., the Nationally Determined Contributions, NDCs) are aligned to the 2030 Agenda Sustainable Development Goals and whether these interlinkages reinforce or hamper climate adaptation and mitigation efforts.

We overcome comparability issues and – by using AI – we aim at offering a fully replicable, reproducible and scalable method



Objectives of the paper

To harness the power of Artificial Intelligence to access new and existing knowledge about climate-sustainable development links



Deploy last generation Large Language Models (LLMs) to elicit knowledge about:

- Sustainable Development Goals (SDGs) explicitly or implicitly tackled by climate actions
- Contribution of SDGs (positive → synergy // negative → trade-off) to climate adaptation and mitigation

To support policy-making processes with cutting-edge, fully replicable tools

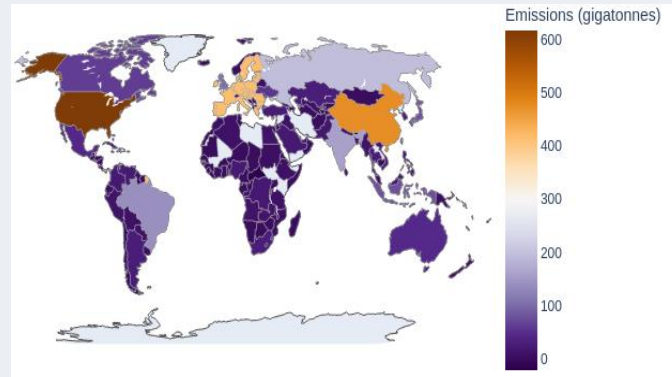
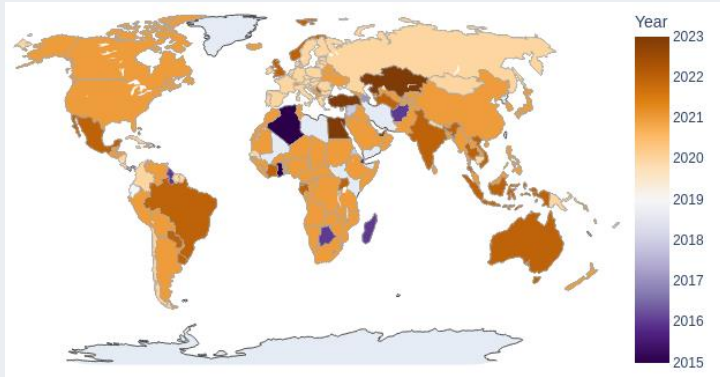


LLMs process unprecedented amount of multi-mode inputs and:

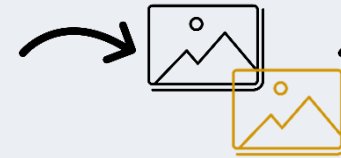
- Overcome comparability issues across non-homogeneous formats
- Can work with multiple languages respecting context-specific expressions

Methodology

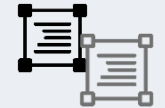
Research design and data collection



Full text
retrieval



Document
split in meaningful
paragraphs



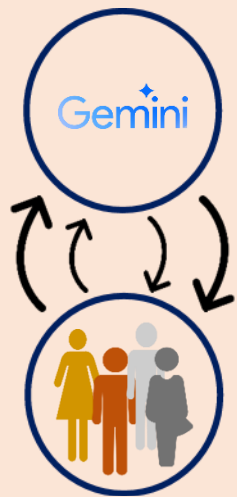
Database
Creation

AI: classification task

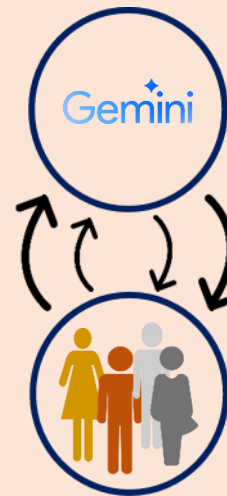
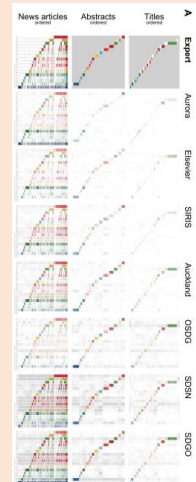
SDG classification and evaluation

AI: Q&A task

Synergy and trade-off identification



We launch
a prompt to
capture the
SDG(s) to
which
paragraphs
relate to

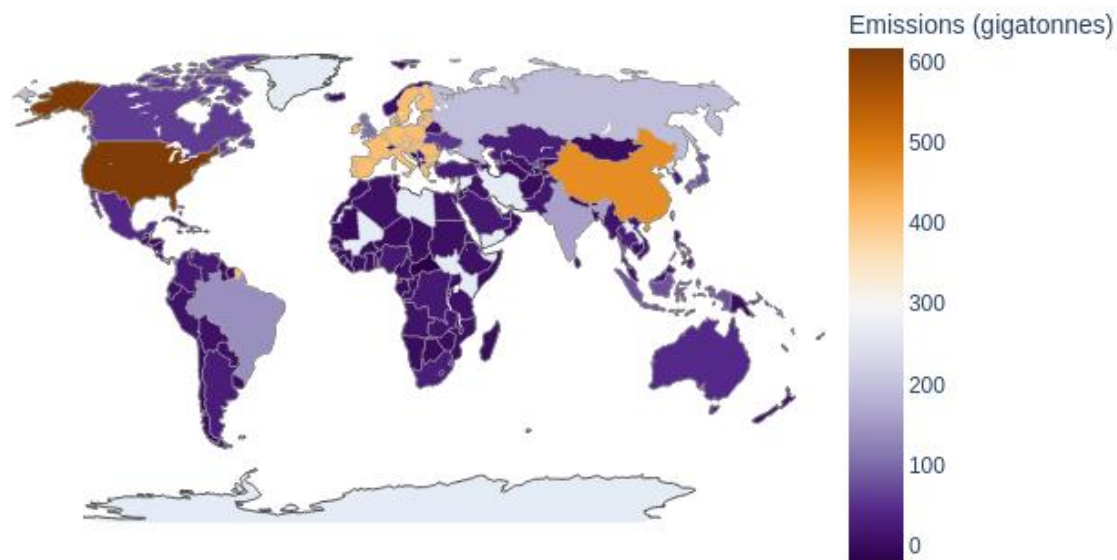


Prompt to capture
whether a
associated SDG(s)
have positive
(synergy) or
negative (trade-off)
impacts on one or
both between
climate adaptation
and mitigation

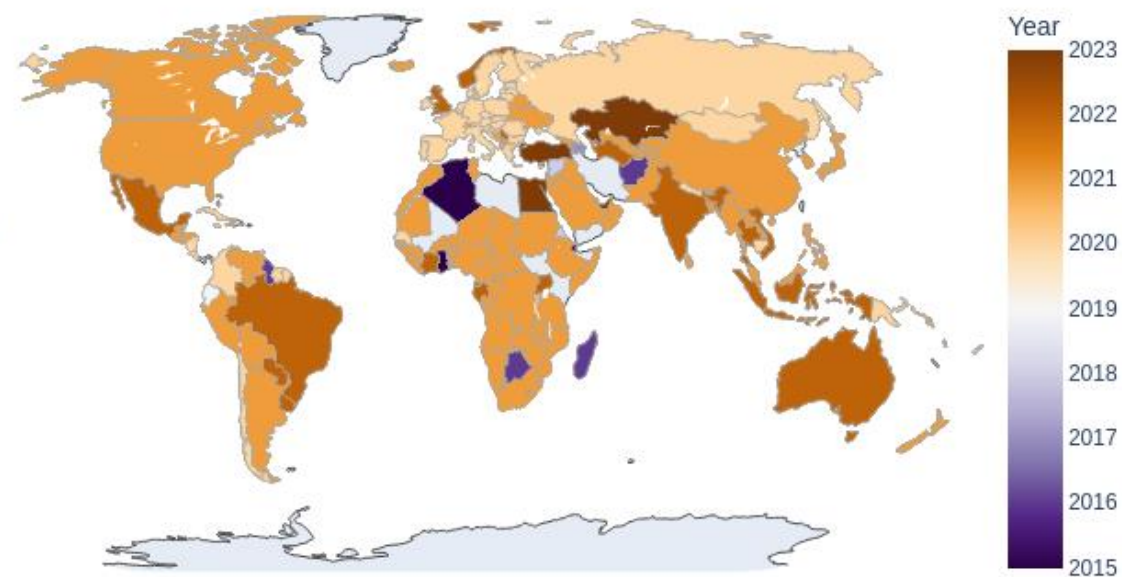


The database: covering >80% emissions worldwide

Historical GHG emissions since 1850



Country Coverage by Year



	Minimum	Maximum	Median
Page number	3 (San Marino)	168 (El Salvador)	36

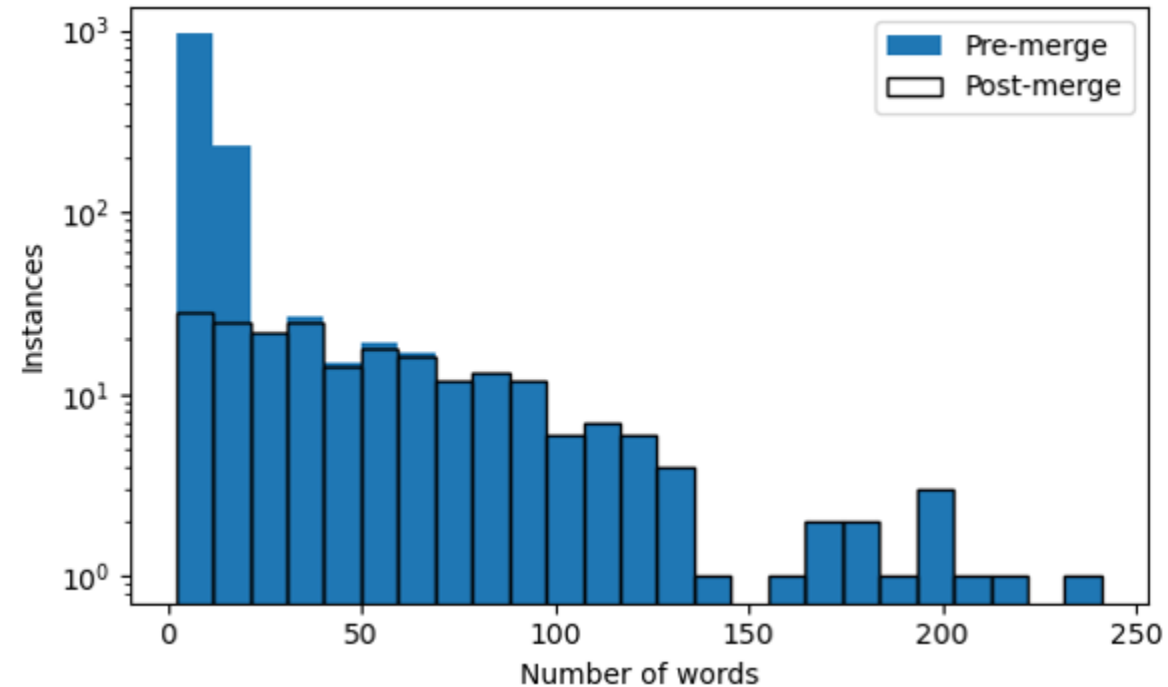
a) Cumulative per-capita emissions. Source: World Emissions Clock, World Data Lab; b) Year indicates submission date as reported in the UNFCCC Registry

The database: creating a meaningful textual unit

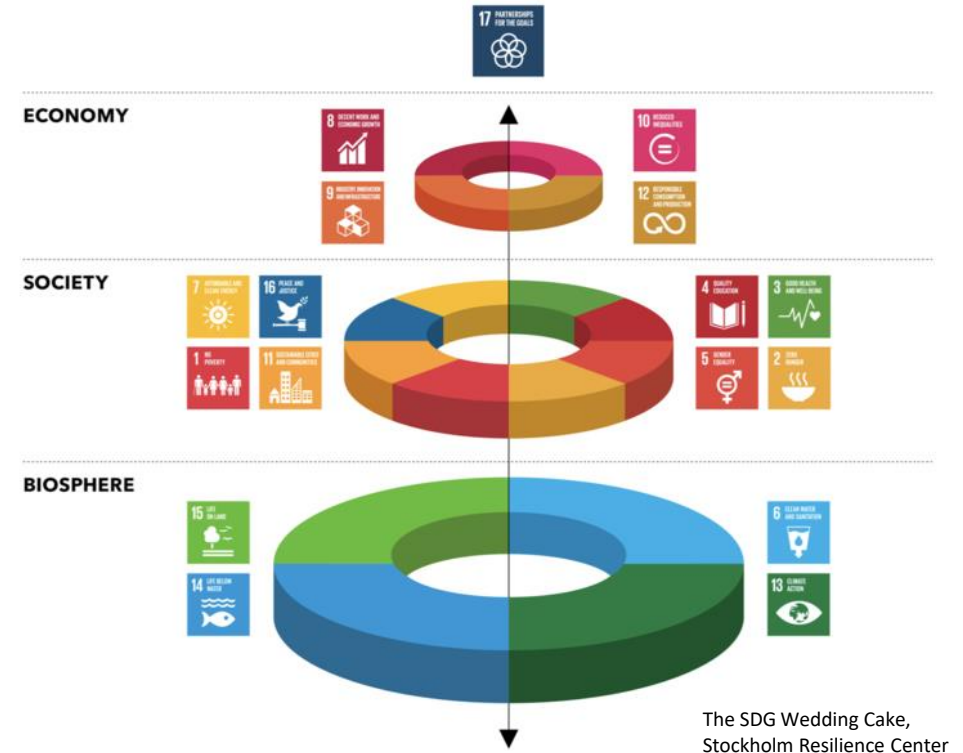
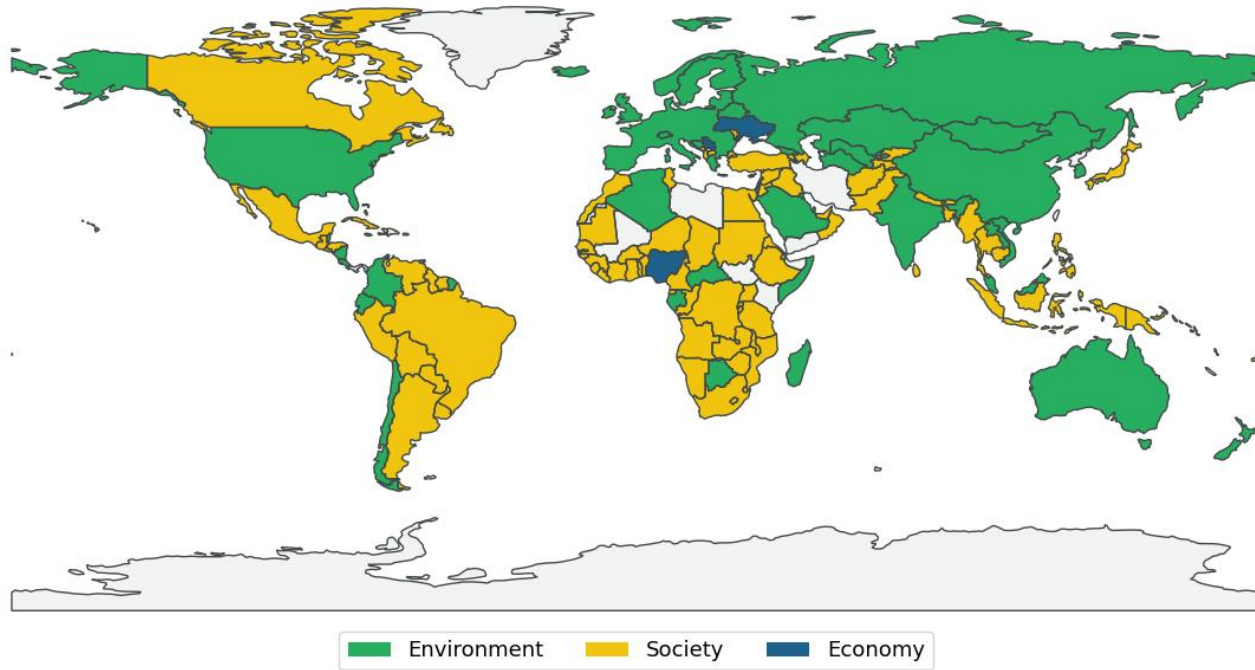
As context matters, context-aware sentences lead to improved results.

Sentence segmentation processes help detecting complete sentences and paragraphs; when no specific sign is available, we use syntactic dependency parsing.

Average paragraph is 65 words (~5 lines in a standard Word document, font size 11).

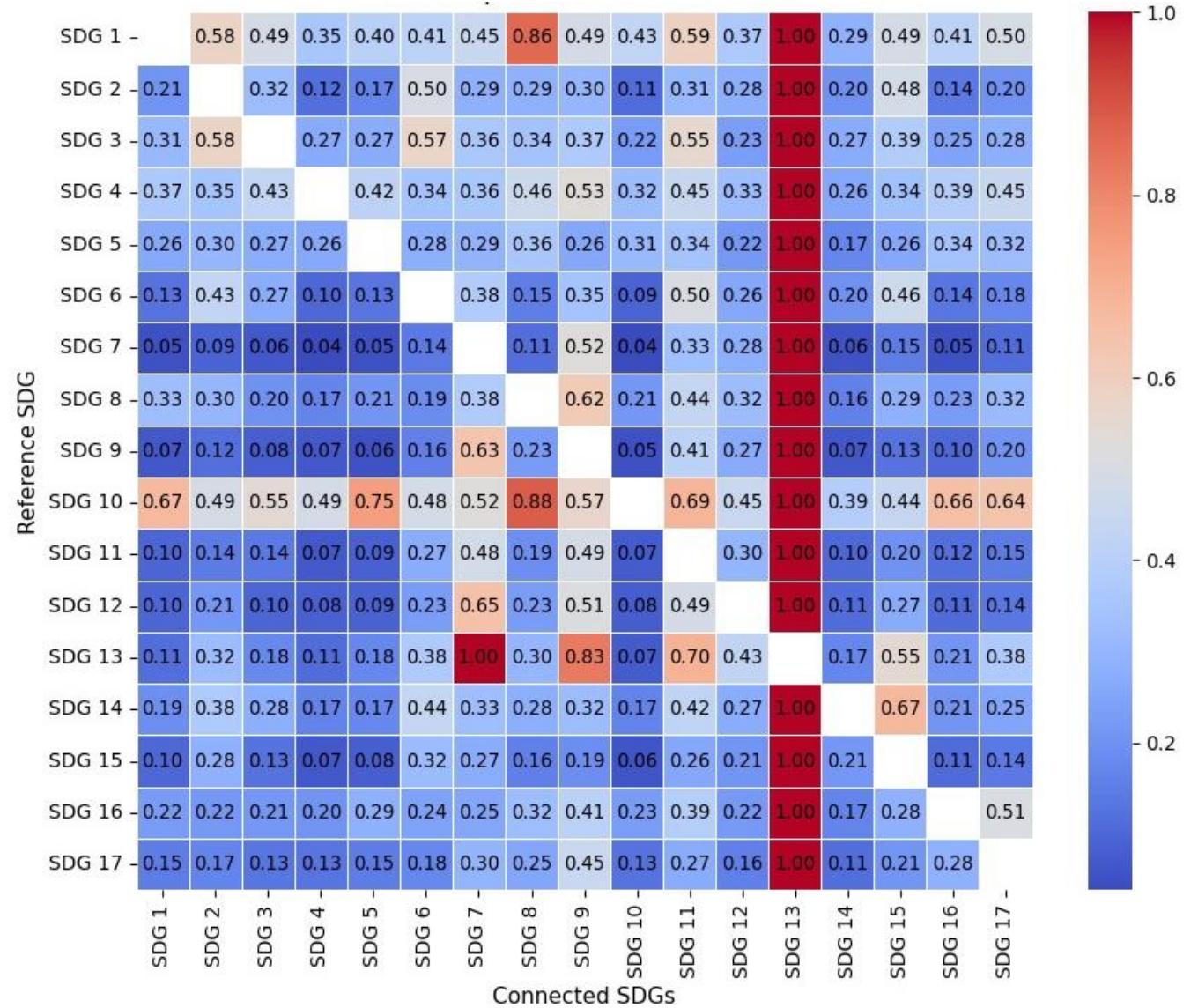


Results 1: exploring domestic foci

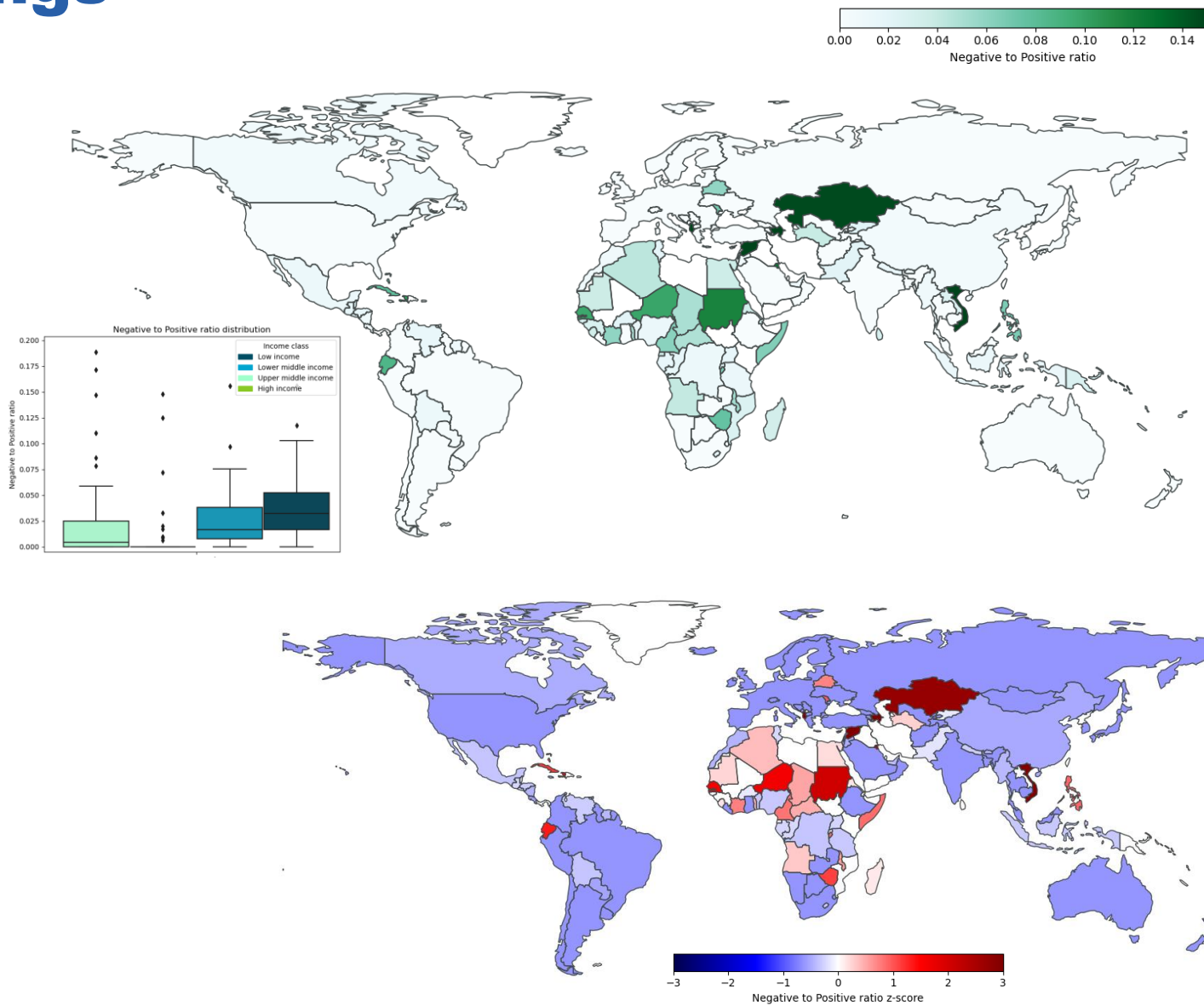
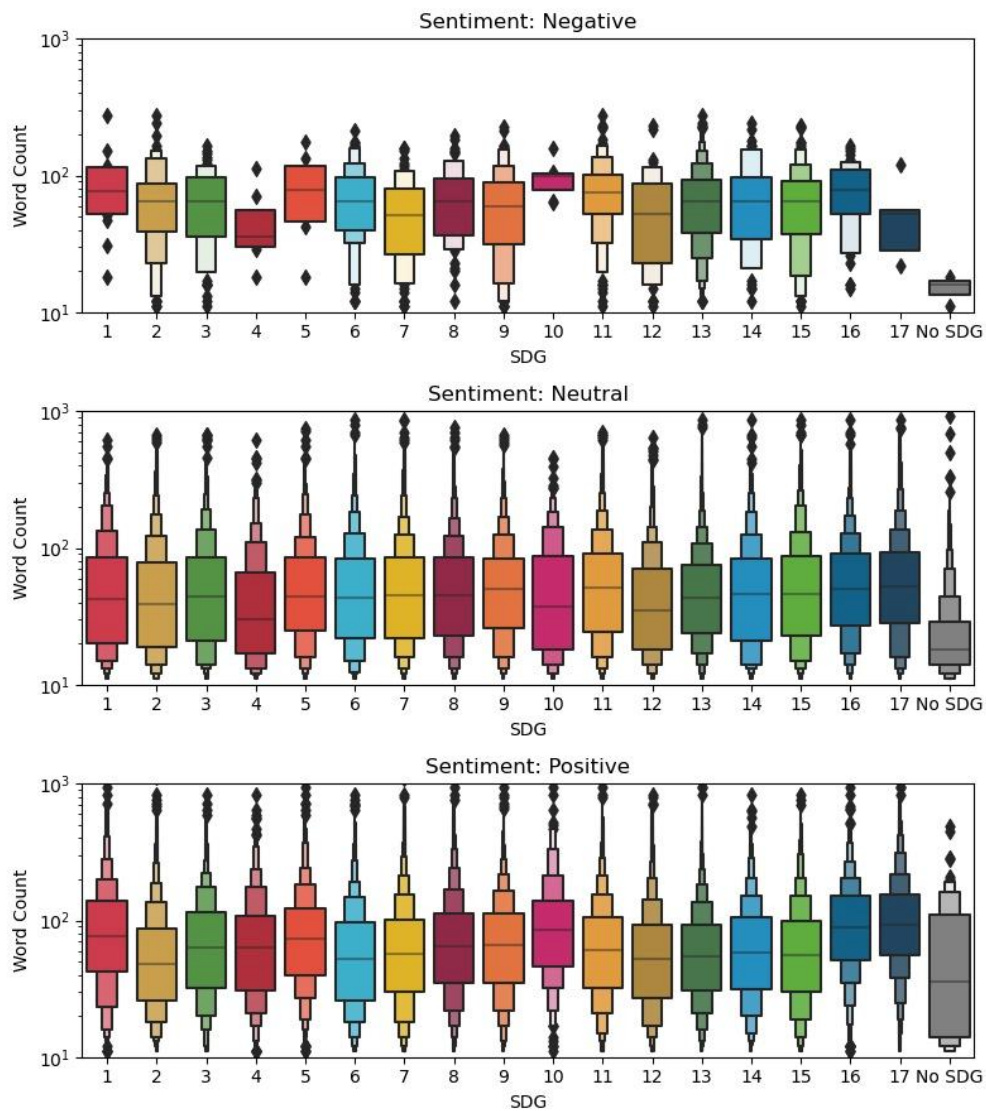


Results 2: new nexuses

Averaged SDG connections for all paragraphs



Results 3: different framings



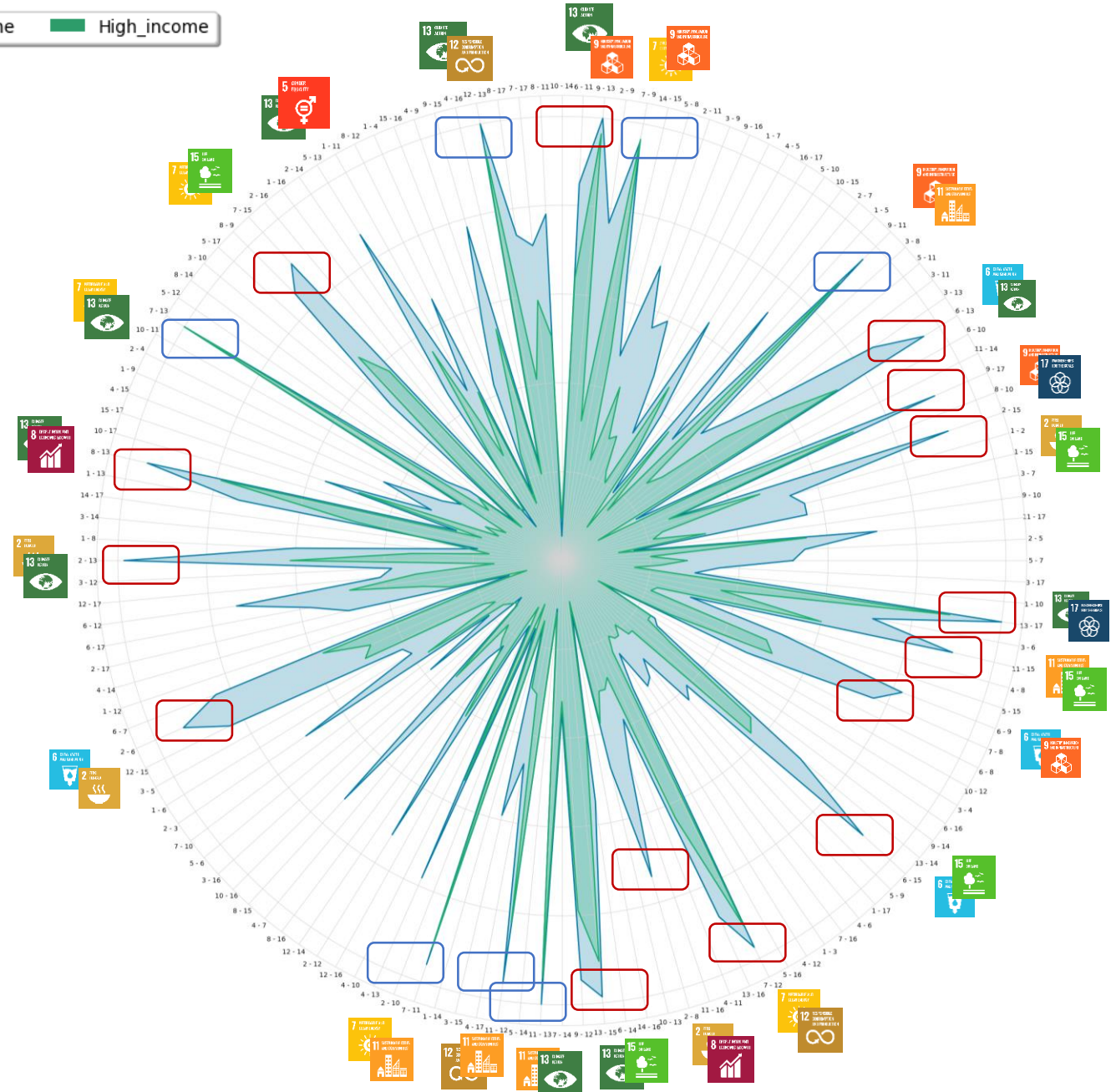
Results 4: synergies

Low_Income High_income

Low and high income countries converge on those synergies capable of triggering positive impacts on climate adaptation and mitigation.

Exceptions – for low income countries - include:

- The focus on "traditional" sectors
- A stronger call for multiple crises at a time (SDG15, SDG6)
- Partnerships include technological transfer and financial needs and they are mostly reinforced in lower-income countries NDCs



Results 5: trade-offs

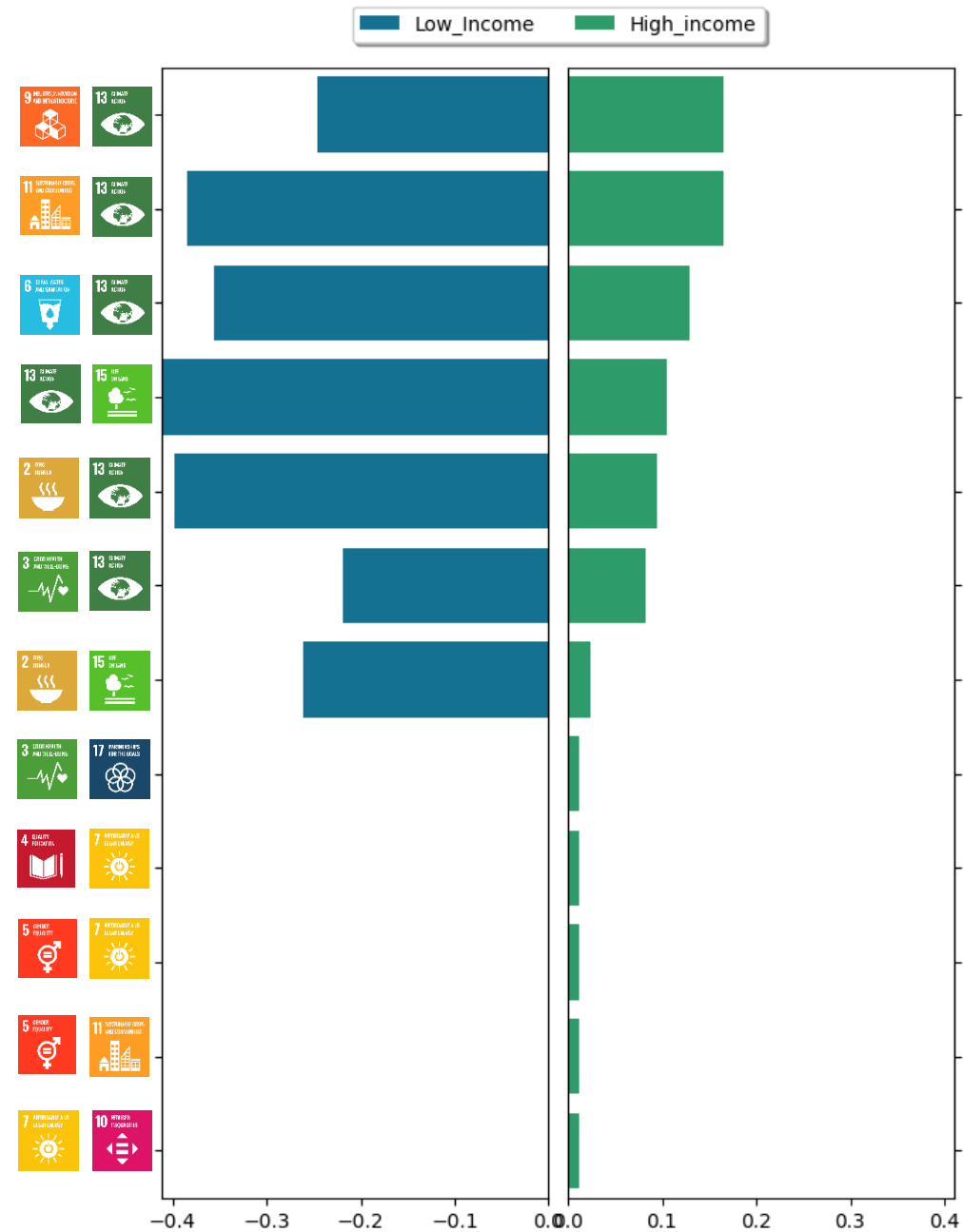
As for synergies, lower income countries discuss their trade-offs between sustainable development and climate adaptation and mitigation with stronger emphasis.

Both adaptation and mitigation are affected by extreme events (SDG11, DRR), with special attention to the transportation sector in Sub-Saharan African countries.

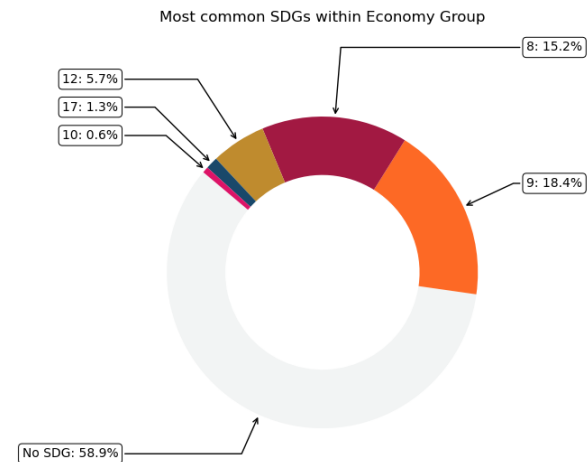
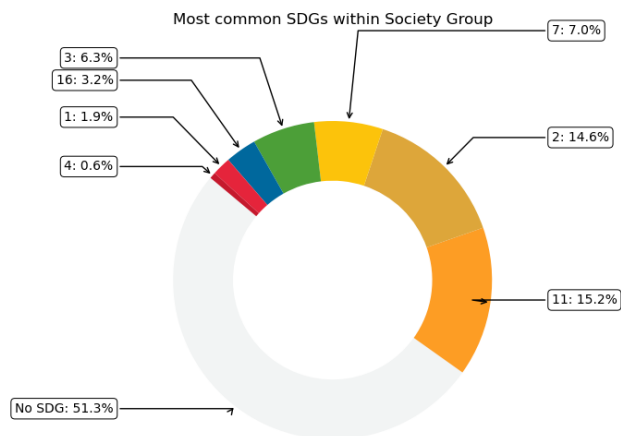
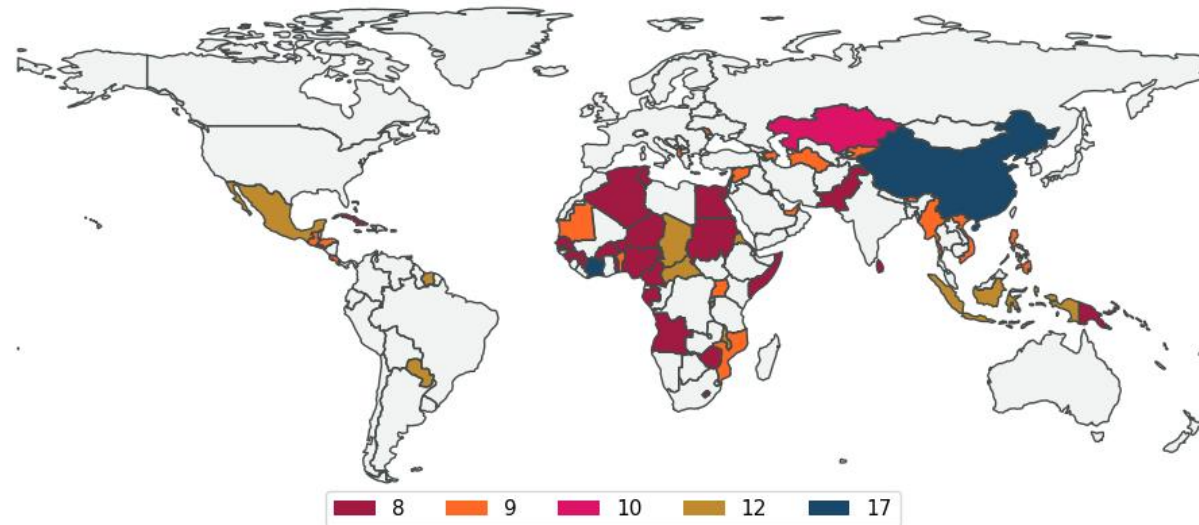
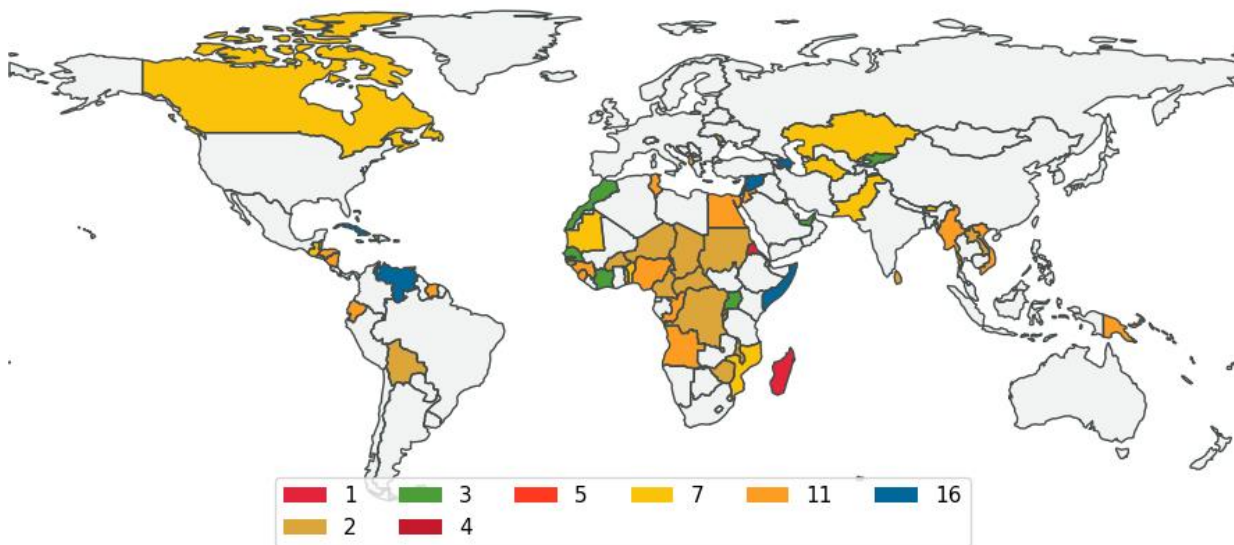
Water critical infrastructures (SDG6) are under threat especially in those countries with little availability of climate physical risks.

”Luxury” concerns: education and gender.

High income countries are putting forward the conflicts between the current job market structure and its skills (SDG4) and the energy transition.



Results 6: zoom into regional trade-offs



Policy implications

Towards a needs-based agenda for the future:

1. *Climate and development assistance finance*

- Key NDCs-SDGs trade-offs and synergies can redefine both quality and quantity of financial flows
- Different instruments for different needs
- Stronger R&D and technological transfer

2. *Different development trajectories and risks*

- Focus on traditional sectors reveals uneven and disorder transition
- Potential lock-in effects must be prevented

3. *Insufficient attention to inequality, education and gender*

- Lack of adequate physical risk assessment tools
- Inadequate shifts towards the "job market" of the future

Thank you

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