Harvesting multiple dividends: Opportunities of carbon farming and trade in Kazakhstan

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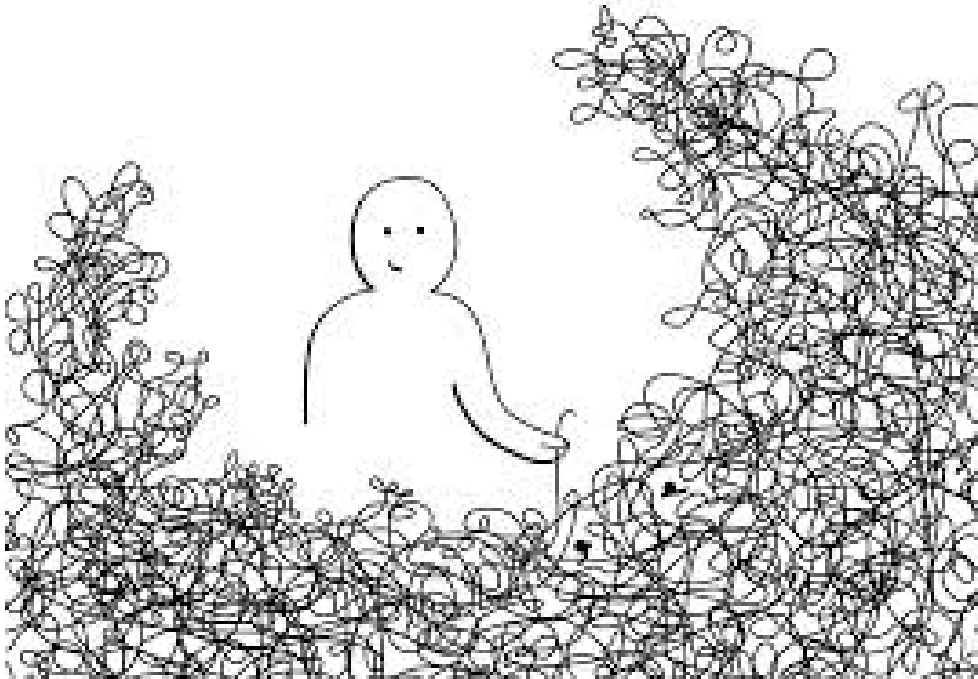
IIASA's Transformations within Reach (TwR) initiative

[Phase 1] The initiative brought together over 200 renowned experts from various disciplines and every region of the world through a series of consultations in order to provide recommendations on what should be done to move towards a more sustainable world that would be more prepared for negative shocks.

Mainstream the approach of co-benefits between development and achieving SDGs.

SDG-specific decision-making realities: complexity and uncertainty => a 'wicked' problem

- Multiplicity of objectives & tradeoffs among objectives
- Positive and negative feedback loops
- Temporal and spatial tradeoffs
- Uncertainty about the future
- Epistemological uncertainty



Source: Cairney (2012): Complexity Theory in Political Science and Public Policy, Political Studies Review, 10(3) 346-358

Major challenge: decision-making under uncertainty and complexity

Biases and confusions – to name a few

”Spoiled for choice” challenge:

- In a case study focusing on individual’s decisions on a medical plan, Hanoch et al. (2009) found that **the ability to correctly answer** the informational questions **declined sharply with the size of the choice set.**

“Feedback loops” challenge:

- Levy et al. (2018) revealed that **more complex forms of causal structure**, such as feedback loops, are relatively **under-represented in mental models** of experts in sustainable agriculture.

“Ambiguity aversion:

- Ellsberg paradox: people’s decisions are inconsistent with subjective expected utility theory (Ellsberg, 1961).

Achieving SDGs including climate action is a complex problem

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RESEARCH ARTICLE
10.1002/2017EF000632

A Systematic Study of Sustainable Development Goal (SDG) Interactions

Prajal Pradhan[1], Luís Costa[1], Diego Rybski[1], Wolfgang Lucht[1,2], and Jürgen P. Kropp[1,3]

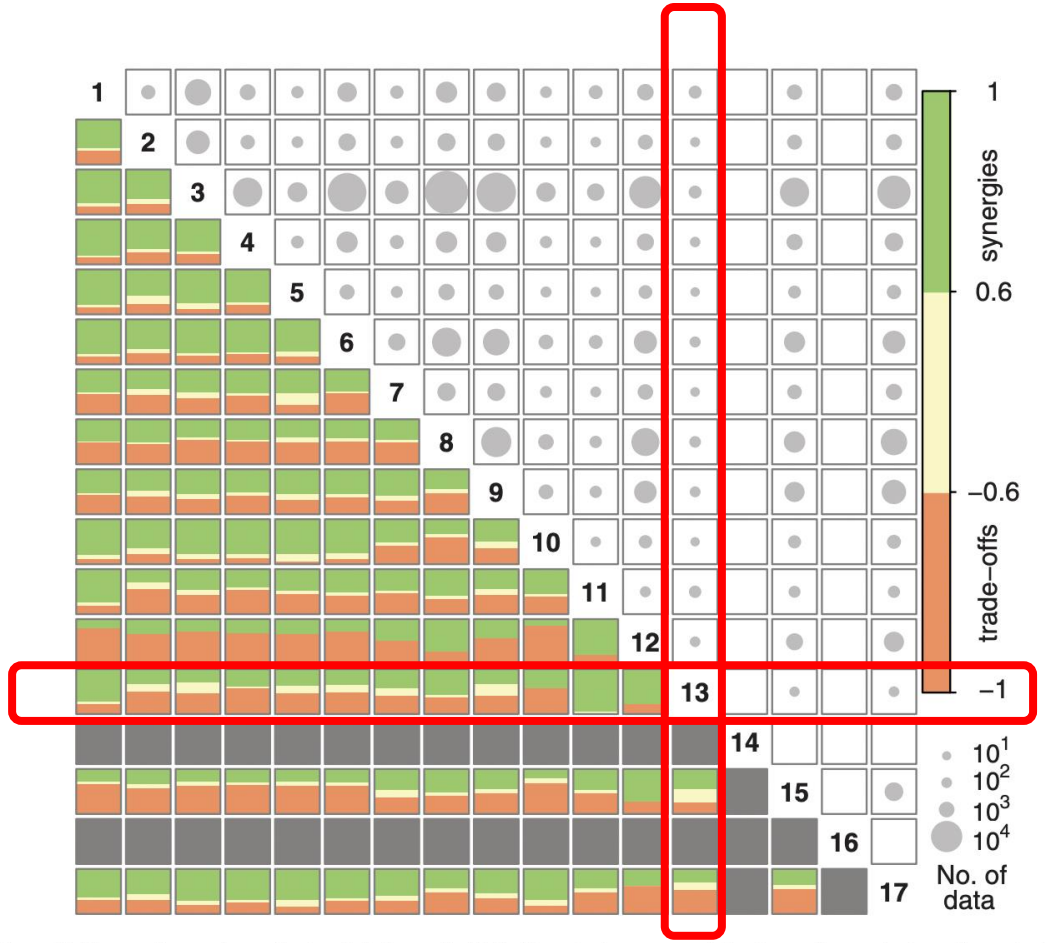

Figure 2. Observed synergies and trade-offs between the SDGs. The color bars represent the shares of synergies (green), nonclassifieds (yellow), and trade-offs (orange) observed between the SDG pairs for the entire dataset. The gray bar depicts insufficient data. The area of the circle in the boxes indicates the number of data pairs (see the legend for comparison). The SDGs are represented by the numbers in the diagonal. Both positive and negative correlations are observed among the SDG pairs with SDG 1 (*No poverty*) expressing synergies among most other SDGs. SDGs 12 (*Responsible consumption and production*) and 15 (*Life on land*) have mostly shown trade-offs with most other SDGs.

SDG achievement seems to be conducive for subjective wellbeing

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Jan-Emmanuel De Neve & Jeffrey D. Sachs

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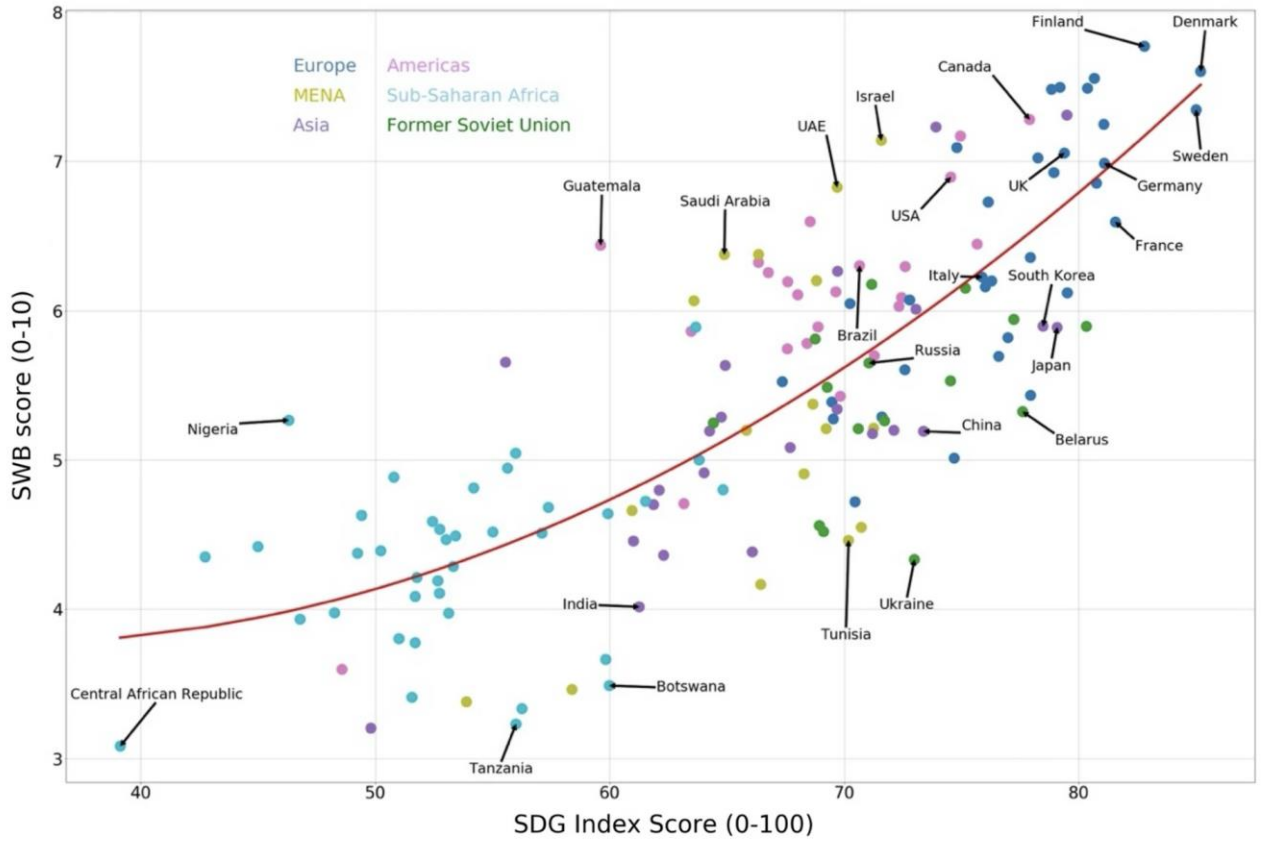
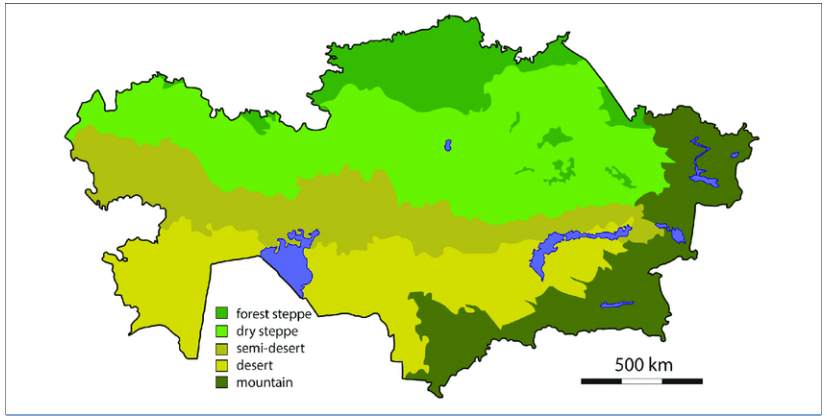


Sustainable development and subjective well-being, a scatterplot for the overall SDGI score (mean of total SDG score, where all goals are weighted equally) and SWB score for all countries in the data set. This scatterplot was produced using matplotlib package (version 3.2.1) in python: https://matplotlib.org.

Example: Carbon farming and trade in Kazakhstan

Carbon farming involves implementing agricultural practices that reduce the emission of greenhouse gases or capture carbon in vegetation and soils

- Kazakhstan has about 57 Mha of degraded land (= about 21% of its total territory, UNCCD 2023), which offer a large carbon sequestration potential.
- This may be especially true for 'Virgin Lands' intensively developed to expand crop production in the second half of the XX century: Estimated to have lost up to 45% of their soil carbon stock in the process.
- A range of land management practices could be applied to result in carbon sequestration by soils and plant biomass or in reduction/avoidance of GHG emissions.
- Sustainable land management practices are currently applied on 1% of Kazakhstan's agricultural lands and its LULUCF sector remains a source of emissions rather than a sink.



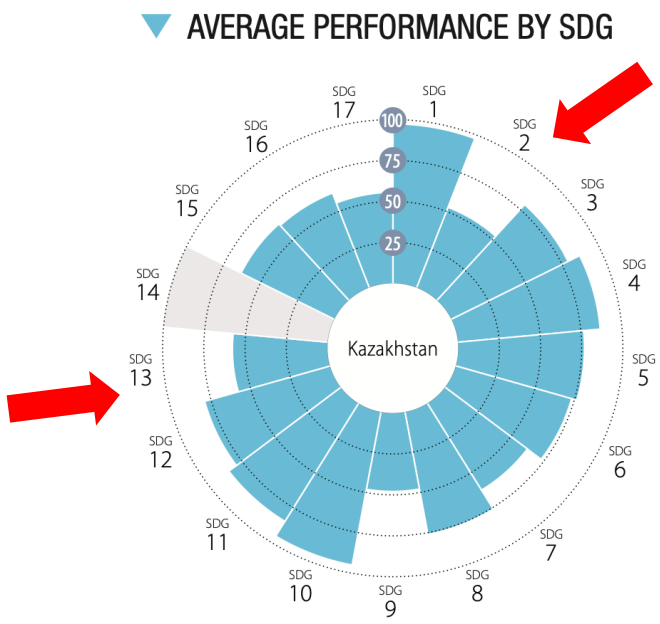
Source: Miller et al (2012)

Example: Carbon farming and trade in Kazakhstan

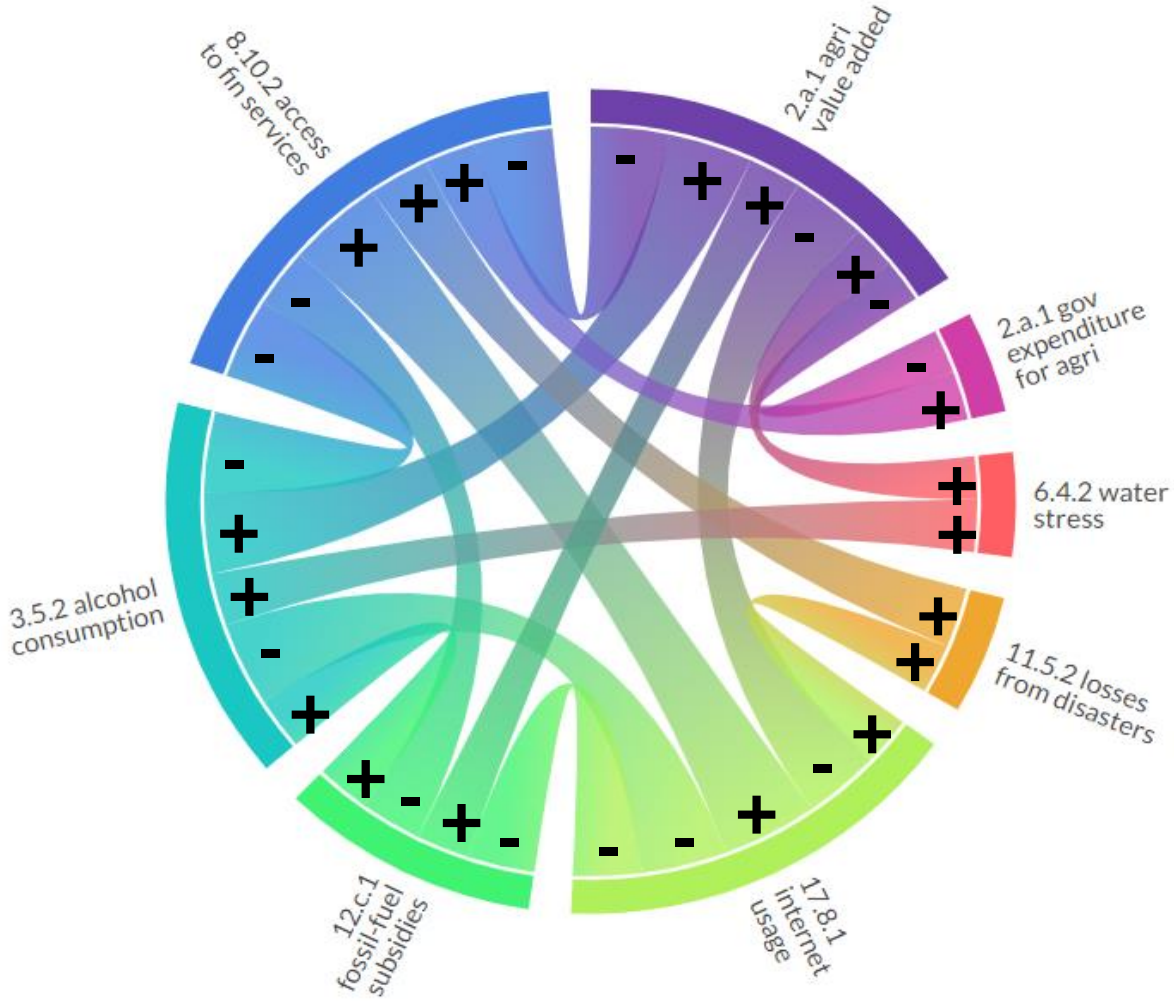
- A balanced and strategic approach to connect People, Nature, and Economy
  - Economy be to supported by Trading of Agri-Land-Soil based Carbon Sequestration Credits and other financial mechanisms
- Carbon Sequestration, Eco-restoration, and Land Degradation Neutrality should be building blocks of the future approach
- Carbon Farming and Trading strategy needs **puts people at the center** of the equation

Jobs Creation	Scientific studies at UNCCD have validated that 2 direct jobs are created with every 10 hectares of degraded land restored
Income Generation	Every 1 dollar utilized on eco-restoration results in 5 to 10 dollars in income generation
Social Inclusion	Important to make women groups, youth and rural communities as major beneficiaries of economic benefits

Potential impact of carbon farming and trade in Kazakhstan on SDGs



- Policy design needs to take into account possible unintended consequences
  - For example, in Kazakhstan, higher levels of agri production were associated with higher water stress and higher alcohol consumption



Pairwise correlations between selected SDG indicators; estimated based on 2001-2021 data; only significant correlations are visualized.

Thank you for your attention

Invitation to collaborate!

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