

Implications of strong environmental
sustainability for the measurement of the
economic importance of ecosystems:
the Environmental Sustainability Gap (ESGAP)
accounting proposal

Presentation to the ISTAT Workshop

‘Challenges in the Measurement of Nature in Official Statistics’

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Outline of lecture

- Sustainability: what does it mean? (slide 3)
- Weak sustainability (slides 4-5)
- Strong sustainability (slides 6-9)
- The ESGAP indicator framework (slides 10-15)
- Implications for SEEA (slide 16)
- Conclusions (slide 17)

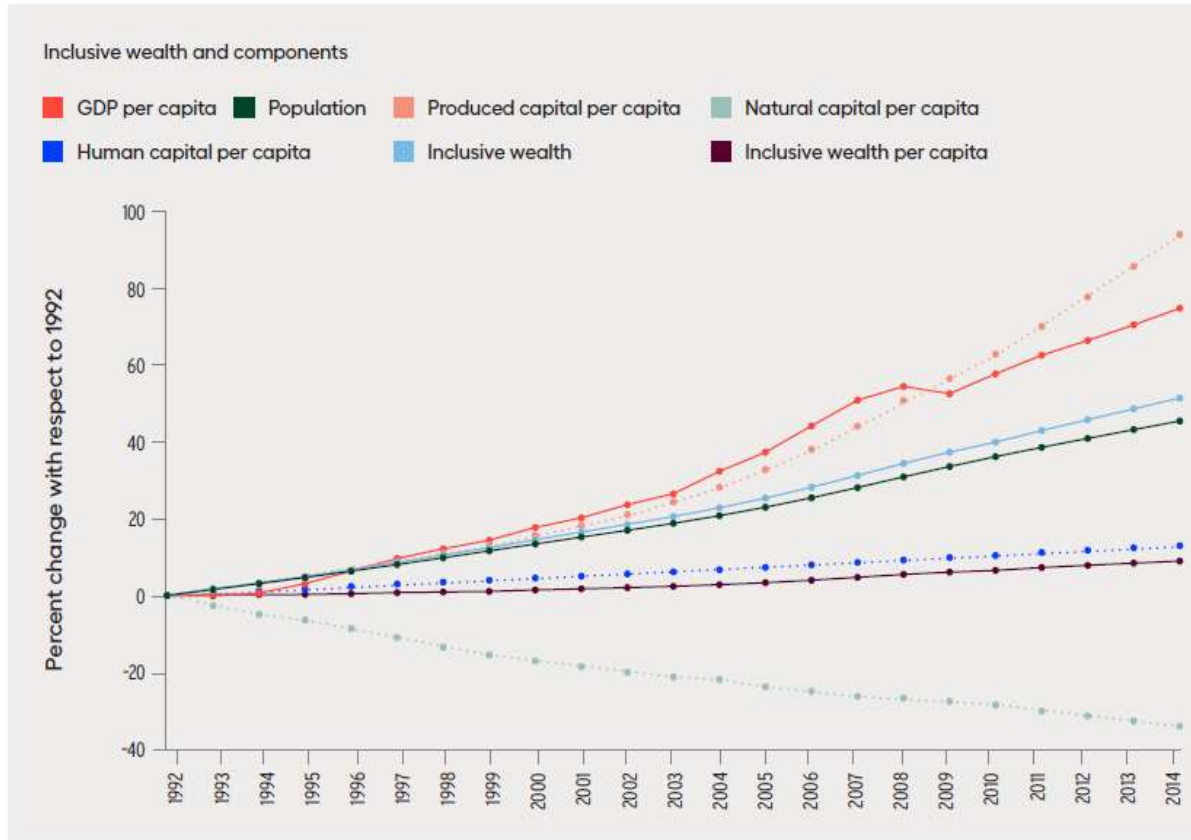
What is sustainability (weak or strong)?

- Capacity for continuance. Of what?
- Weak environmental sustainability: express environmental issues (costs, benefits, investments) in monetary terms and:
 - Maximise net benefits (cost-benefit analysis)
 - Ensure that overall investment is positive (inclusive wealth)
- Both weak environmental sustainability approaches have led to systematic environmental deterioration, as the environment is traded off against economic and social benefits
- Strong environmental sustainability: ensure minimum standards of environmental performance
- Both approaches can be understood through concept of capital, where sustainability is seen as maintenance of the capital stock

Weak sustainability

- The underlying principle of a weak sustainability approach is that there is broad substitution between different forms of ‘capital’ (produced, human, natural)
- “[E]conomic development is sustainable over a period of time if net investment in the economy's stock of assets is positive during the period. That is net investment in the *aggregate*, which means that even if stocks of some capital goods were to decline (in quantity or quality, or both), net investment would be positive if sufficient investment were made towards the accumulation of the remaining assets.” (Prof. Partha Dasgupta, Foreword to *Inclusive Wealth Report 2018*, p.ix)
- This has led to massive substitution of physical (manufactured) and human capital for natural capital (i.e. resources and the environment).

Figure 7.3 The steady decline in natural capital



Source: UNEP 2018b.

- Increase in inclusive wealth per capita implies sustainability
- Overall message: 'Natural capital is declining but that's still sustainable because the capital stock overall is increasing.'

Natural capital in Inclusive Wealth 2018: systematic depletion of resources

Source: UNDP Human Development Report 2020, <https://hdr.undp.org/sites/default/files/hdr2020.pdf>

Insights from the natural sciences

- Motion 62, Principle 3, from the IUCN congress in Marseille :
*“Application of the concept of natural capital through any given natural capital approach must at the very least maintain, but preferably enhance, the condition of natural capital. **This implies that natural capital approaches should not lead to the substitution of natural capital with other types of capital**”*
(<https://www.iucncongress2020.org/fr/motion/062>)

Time for a new approach: strong sustainability

- UNEP's sixth *Global Environment Outlook (GEO6)* and a host of scientific studies confirm environmental deterioration across a wide range of environmental issues.
- Most policy making to address this has used a 'weak sustainability' approach. The ongoing environmental deterioration shows that this has largely failed.
- For some forms of capital (e.g. 'critical natural capital') there is no substitutability, i.e. no other forms of capital can produce the same goods or services
- This calls for a shift to a 'strong sustainability' approach.
- A scientifically robust measurement methodology now exists to do this.

The strong environmental sustainability approach

- Accept that 'strong environmental sustainability' provides a better description of the world than 'weak environmental sustainability'
- Recognise the validity of the concepts in the scientific literature of 'planetary boundaries', 'safe operating space' and 'environmental sustainability standard'
- Definition of strong environmental sustainability: maintenance of important environmental functions and the natural capital which generates them. Importance (critical natural capital):
 - Not substitutable, irreversible loss, 'immoderate' losses
 - Maintenance of health, avoidance of threat, economic sustainability
- Work this through using the **environmental sustainability gap (ESGAP) indicator framework**

The ESGAP methodology

- **Structured around four broad functions**
 - Source: provision of biotic and abiotic resources
 - Sink: assimilation of waste
 - Life Support: maintenance of ecosystem health and function
 - Human Health and Welfare: other functions related to human health or amenity
- **.... And seven broad sustainability principles:**
 - No disruption to global ecosystem processes
 - Emissions to ecosystems within critical loads
 - Maintenance of biodiversity and ecosystem health
 - Maintenance of human health
 - Conservation of important landscapes and environmental amenities
 - No excessive depletion of non-renewable resources
 - Sustainable use of renewable resources
- **Scientific reference standards for different topics**
- **21 indicators showing environmental performance against these standards**
- Indicators aggregated according to the OECD/JRC Handbook on composite Indicators to produce the **Strong Environmental Sustainability Index (SESI)**
- Computed for 28 European countries.



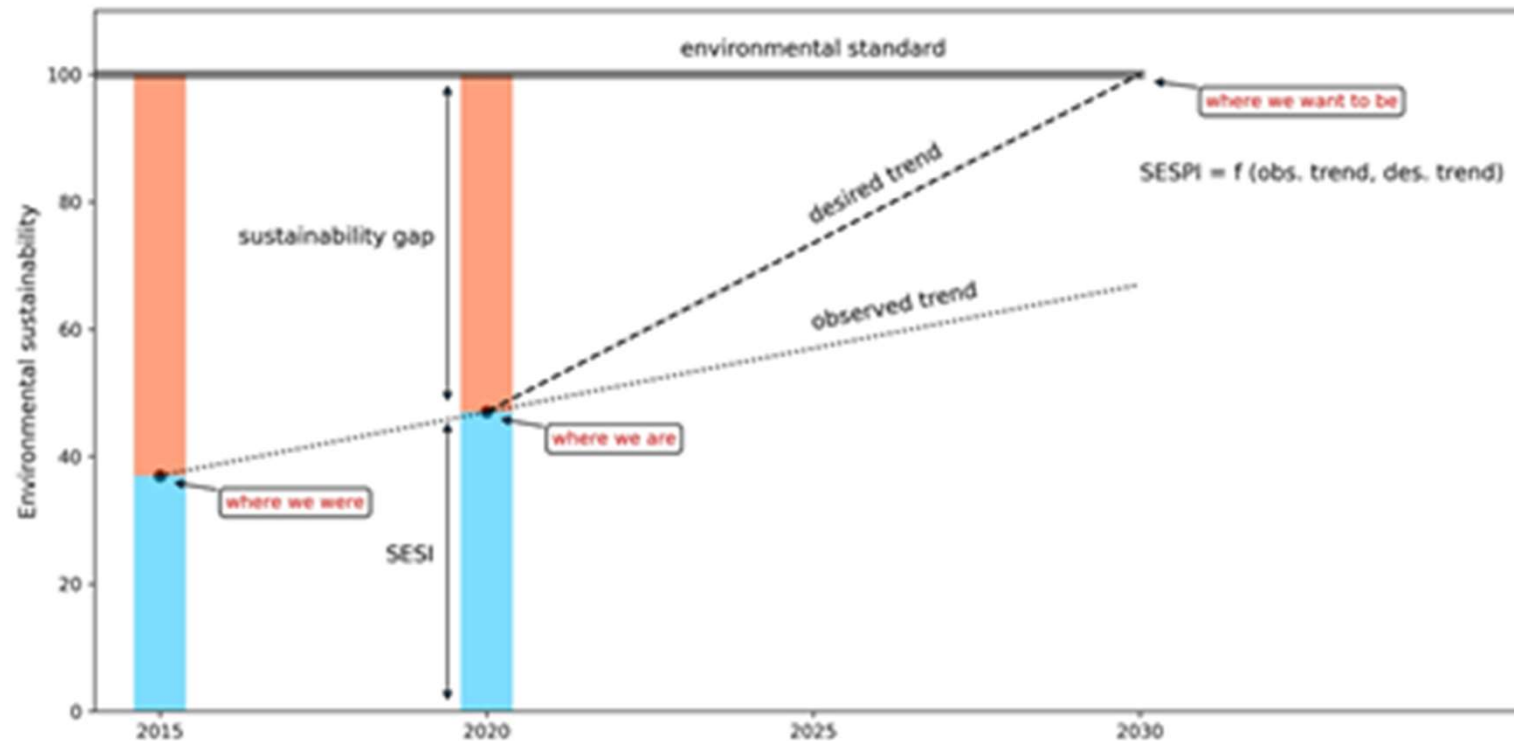
Construction of the SESI

A snapshot of a country's environmental performance against scientific reference standards of the delivery of environmental functions

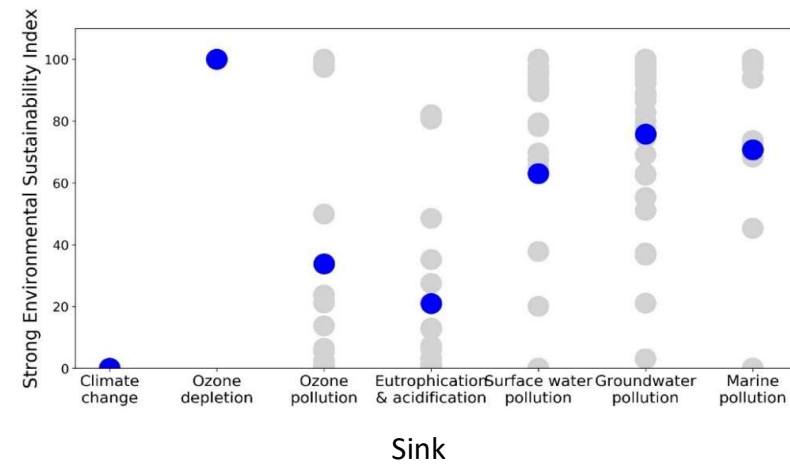
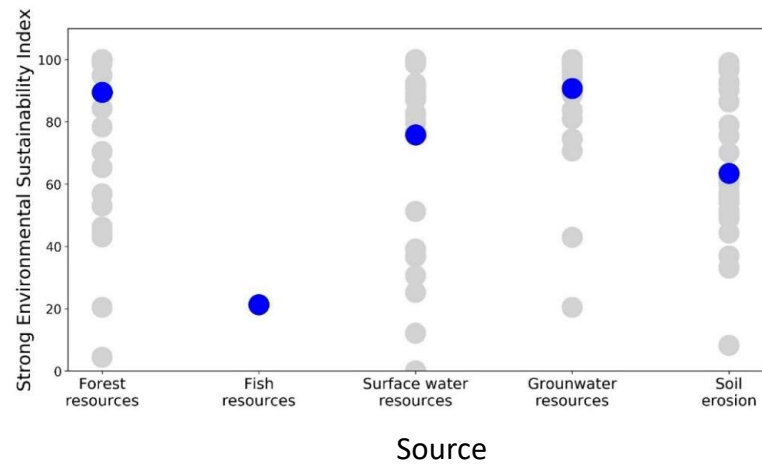
Construction encourages focus on closing largest gap

The Strong Environmental Sustainability Progress Index (SESPI)

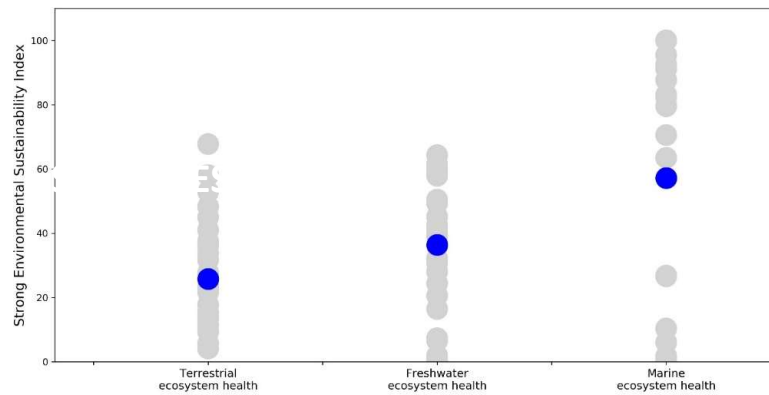
Usubiaga-Liano, A. and Ekins, P. 2022 'Are we on the right path? Measuring progress towards environmental sustainability in European countries', *Sustainability Science*, doi.org/10.1007/s11625-022-01167-2



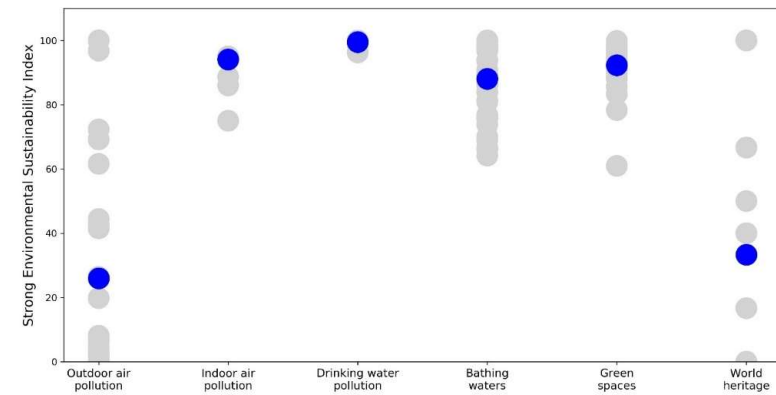
Indicator results



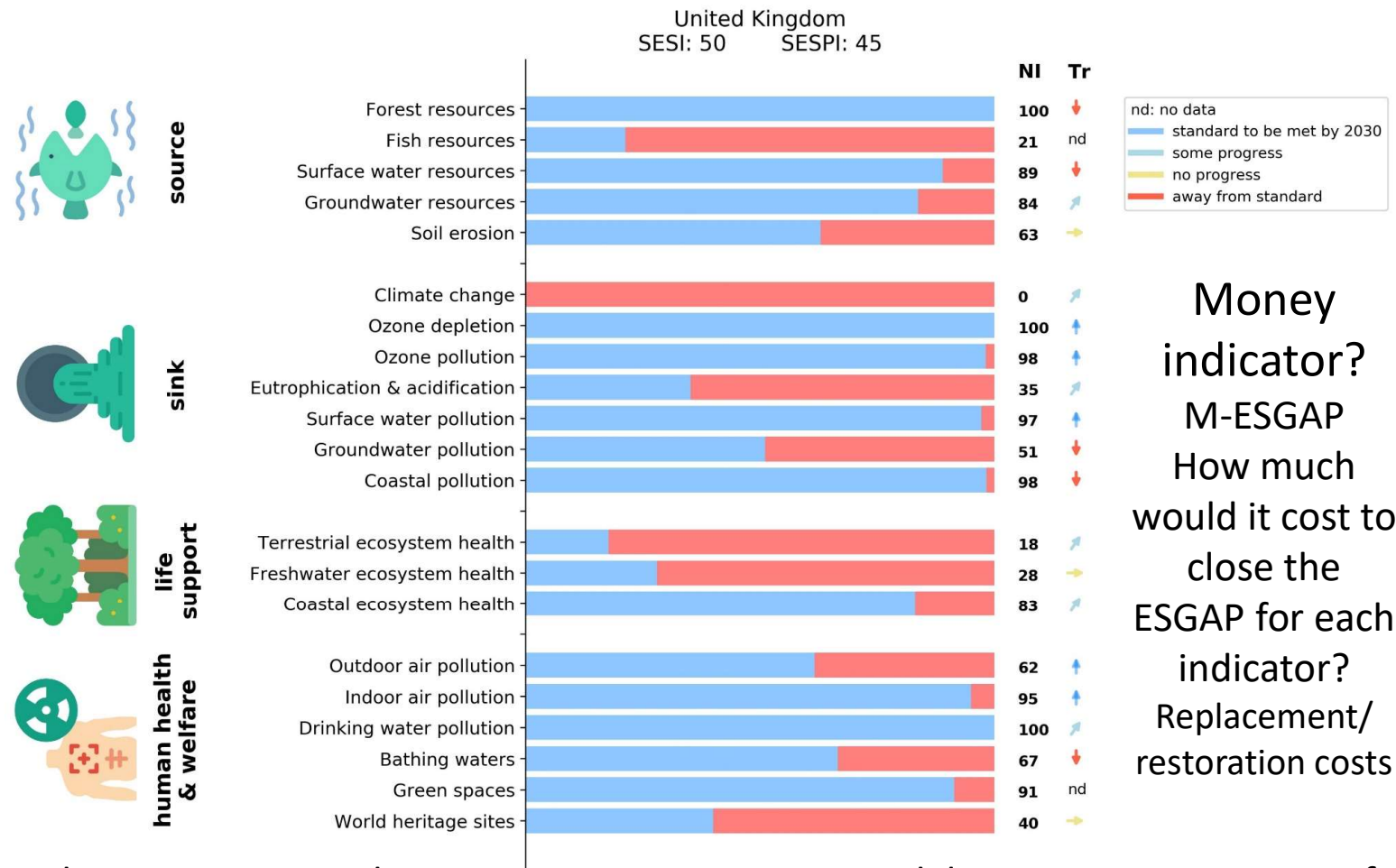
Life support



Human health and welfare



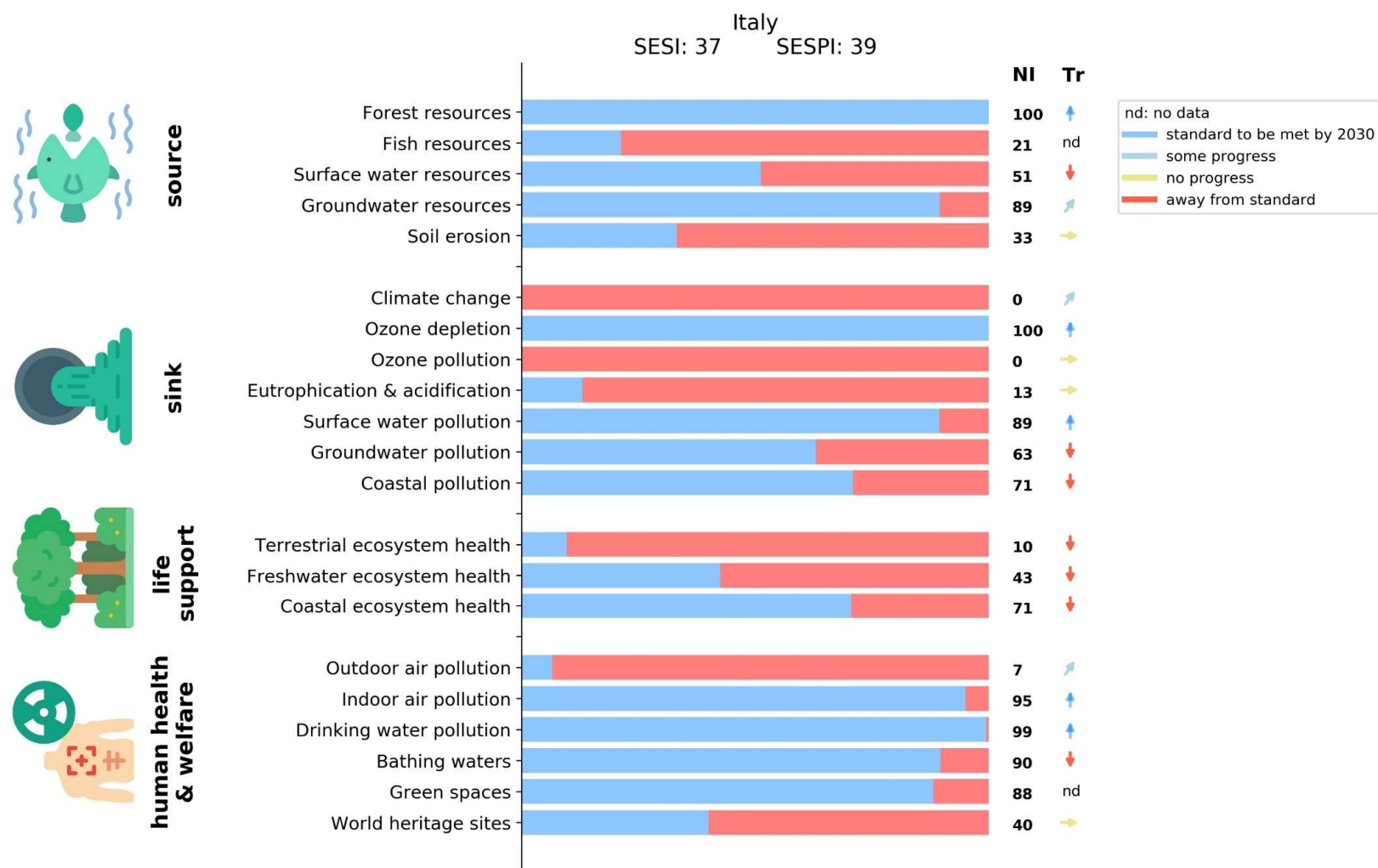
Country results



Plug M-ESGAP numbers into a macroeconomic model to get impact on GDP of becoming environmentally sustainable

Money
indicator?
M-ESGAP
How much
would it cost to
close the
ESGAP for each
indicator?
Replacement/
restoration costs

Country results



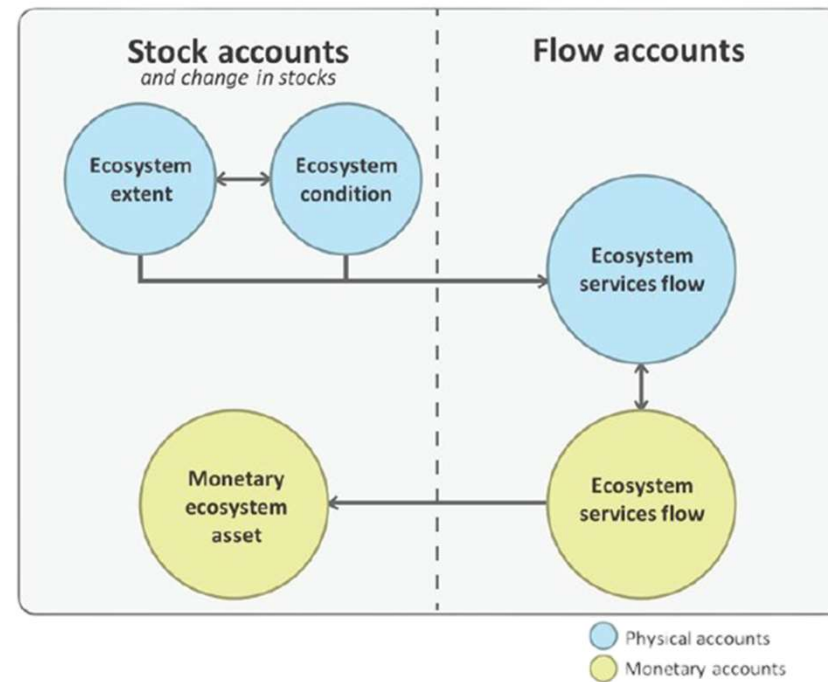
Methodology of a strong sustainability approach

- Articulate a 'safe operating space' or 'environmental sustainability standards' for human activities across the full range of scientific issues
 - Define indicators based on scientific environmental standards
 - Express these indicators at the national level in a way that is accessible for policy makers
 - For the ESGAP approach: aggregate these indicators into two indexes that show the current 'sustainability gap' (Strong Environmental Sustainability Index (SESI) and the trend towards closing it (Strong Environmental Sustainability Progress Index (SESPI))
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- Usubiaga-Liano, A. and Ekins, P. 2021 'Time for Science-Based National Targets for Environmental Sustainability: An Assessment of Existing Metrics and the ESGAP Framework', *Frontiers in Environmental Science*, November, <https://doi.org/10.3389/fenvs.2021.761377>
 - Usubiaga-Liano, A. and Ekins, P. 2021 'Monitoring the environmental sustainability of countries through the strong environmental sustainability index' *Ecological Indicators*, Vol.132, December, <https://doi.org/10.1016/j.ecolind.2021.108281>
 - Usubiaga-Liano, A. and Ekins, P. 2022 'Are we on the right path? Measuring progress towards environmental sustainability in European countries', *Sustainability Science*, <https://doi.org/10.1007/s11625-022-01167-2>

Where does this leave the monetary valuation of environmental impacts and resources?

When natural capital is not critical or strong sustainability standards have been met (i.e. scope for substitution of capital, weak sustainability), standard environmental economic valuation methods may be used for:

- Benefit-Cost Analysis – using welfare values
- The UN System of Environmental Economic Accounting – using market prices
 - Central Framework (SEEA CF, 2012)
 - Ecosystem Accounting (SEEA EA, 2021)



Conclusions

- The systematic trade-off of natural capital (resources and the environment) for economic gain has brought about the crises of climate, nature and pollution
- For important environmental functions ('critical natural capital'), the weak sustainability mind-set which has justified this trade-off must be abandoned for a strong sustainability approach
- This requires the use of science-based environmental standards to define a 'safe operating space' for human activities, where these functions are maintained
- A dashboard of indicators related to these standards needs to be defined at the national level as this is the level at which most environmental policy is set
- These indicators must be able to be aggregated into a single figure to give policy makers and the public an immediate view of how far a country is from the safe operating space, and whether it is moving towards it or not.
- The ESGAP approach with its indices SESI and SESPI fulfils these strong sustainability criteria and give policy makers the summary information that they need.
- Environmental economic valuation has a role in weak sustainability situations, through benefit-cost analysis (welfare values) and SEEA (market values).



Thank you and questions

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