

Biodiversity related risks and opportunities to financial sector: Pitching slide

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Table of Contents

Slides 3-7	Project overview and origin of the project
Slides 8-11	Background information about the project
Slides 12-14	Project outputs
Slides 15-16	Project team
Slides 17-19	Examples of project results
Slides 20-22	Information about WUR & contact details

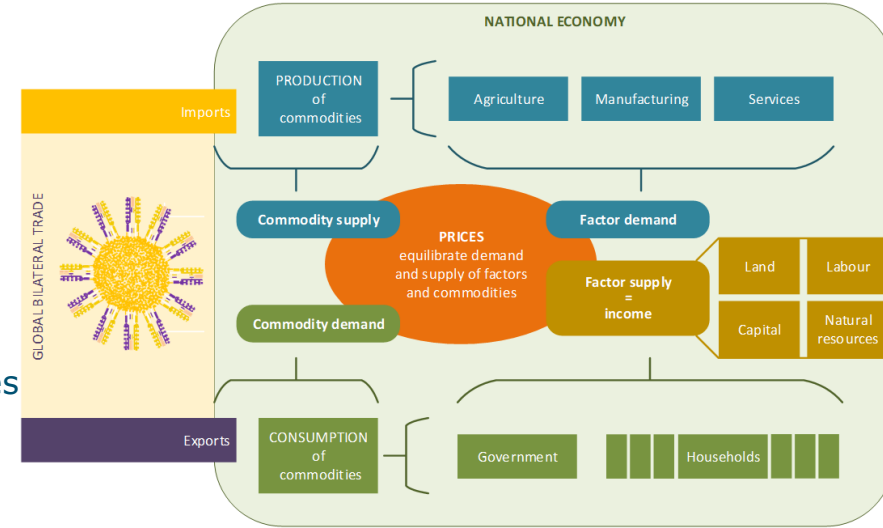
1. Project overview and origin of the project

Our aim: Monetary estimates for sectoral and country level biodiversity effects and investments

Wageningen University and Research (WUR) has been upgrading MAGNET general equilibrium model with the ability to look at sectoral economics effects of biodiversity loss on economy and vice versa.

WUR proposes to provide insight in **two areas**:

1. Sectoral and country level monetary economic effects of biodiversity loss
2. List of biodiversity adaptation and restoration measures and their cost effectiveness and investment estimates



An improved exercise for new ecosystem services through a 4 year private-public partnership (PPP) project

- A partnership between WUR and 3-5 private sector companies, led by a private sector organization
- Focus: Most important ecosystem services, sectors and specific major countries for private sector are selected in the proposal stage: 5 Ecosystem services, major countries the financial sector parties are working on (. Please see detailed project background and motivation in the Appendix.
- Governance: Private sector party(ies) lead(s), WUR conducts the research and project management
- Outputs: Sectoral and investment level biodiversity effect, cost-effectiveness, and investment estimates, shared with the project partners via a database and dashboard as well as explanatory notes and reports:
- Duration: 4 years, January 2024-December 2027



Positioning of this this project

- The project will position itself as an initiative to demonstrate thought-leadership and best practices on biodiversity through workshop and scientific papers.
 - The summary of the results of the project will be published in reports.
 - The detailed sectoral and country level data can be protected by IPR rights while summary results can be published.
- Positioning of the project will also provide sustainability of the project: embedding the initiative's output to a public or private database (e.g., Bloomberg environment database) that provide follow-up finance.
 - Inviting those initiatives to the project workshops and sharing the workshops and parallel discussion.
- Please note that alignment of the IP rights and public output shared by the project will be determined by the consortium partners.

This project is being built on an existing collaboration with Allianz

- WUR-Allianz collaboration: 2022-2023
- Pollination services loss (PSL) in 2022 and soil degradation in 2023:
- Two main objectives:
 - Monetary effects of various PSL shock scenarios in Western Europe and the United States, sectoral level.
 - Cost-effectiveness of farm management measures in abating PSL.
 - Please see our existing results on [monetary effects of various PSL shocks scenarios for Dutch economy](#) and [cost-effectiveness estimates](#) in the Appendix.

Background information about the project

Why this PPP?

If the world economy functions as usual and continues losing essential ecosystem services that biodiversity provides, it will also lose 0.67% of global GDP per year (equivalent to about 479 billion US dollars per year) until 2050 (Johnson et al., 2021)

*To adapt and mitigate to biodiversity loss, the financial sector needs **location and sector specific quantities and monetary figures** on:*

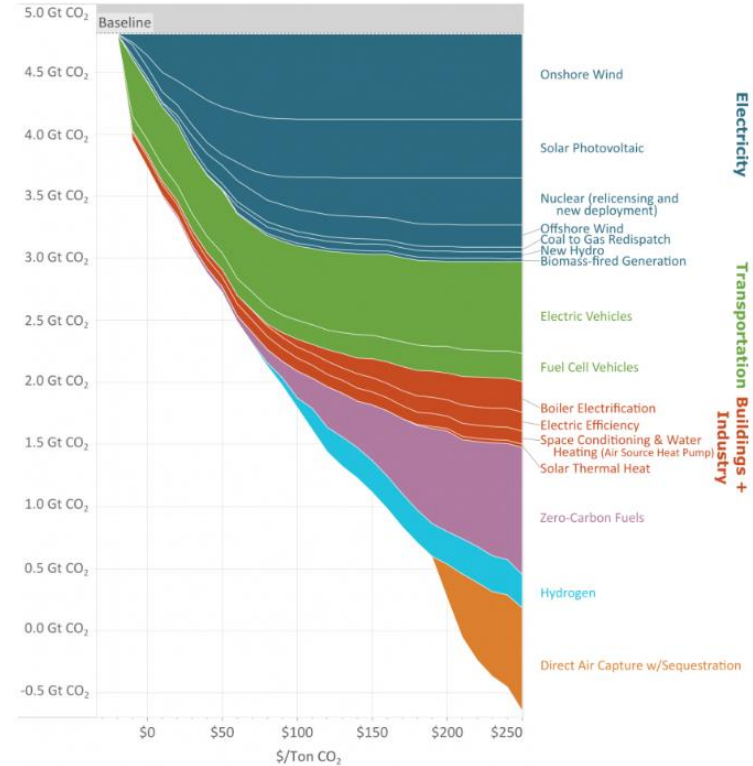
- Biodiversity related effects of private sector investment (litigation and liability risk)*
- Impact of biodiversity loss on economy (physical and financial risk)*
- Financial costs and benefits of abatement measures, and capital investment requirements (opportunities)*

Why this PPP?

- On 5 January 2023, the Corporate Sustainability Reporting Directive (CSRD) entered into force. This new directive modernises and strengthens the rules concerning the social and environmental information that companies have to report.
 - EU law requires all large companies and all listed companies to disclose information on what they see as the risks and opportunities arising from social and environmental issues, and on the impact of their activities on people and the environment.

Why this PPP?

- Financial sector needs to quantify biodiversity related risks and opportunities for biodiversity like what has been done for climate change
- This requires development of a model and data platform including quantified/monetary estimates for the risks related to ecosystem services loss, and costs and benefits of abatement measures.



J. Farbes, B. Haley, and R. Jones, "Marginal abatement cost curves for U.S. net-zero energy systems: A systems approach," 2021. [Online]. Available: https://www.edf.org/sites/default/files/documents/EMBARGOED_MACC_2.0_report_Evolved_EDF.pdf.

2. Project outputs

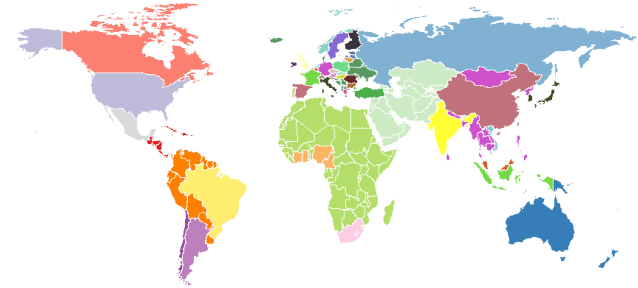
Main outputs of the project: A dashboard integrating two data sets

- Data set including data points showing the monetary effect of losing 5-7 ecosystem services at sector-country/region level for different scenarios:
 - Pollination services and soil quality plus 3 to 5 new ecosystem services defined according to ENCORE classification: selected together with the private sector partners by their importance for the financial sector and general economic activity

Financial sector companies will use the estimates for stress tests:
Please see an early application of the output [in Allianz report](#):

- Dataset of abatement measures to restore or abate biodiversity loss including their implementation costs, capital investment needed, economic benefits in monetary terms.

Financial sector companies will use the data to determine the market size for biodiversity related investment areas and key investment areas.



Project reporting and other project outputs

- In 2024, the project will deliver research results on two ecosystem services, pollination and soil quality ecosystems, which Wageningen Economic research has already built knowledge on.
- Between 2025 and 2027, the project will update databases with new estimates for at least one ecosystem service each year while improving the previous estimates with feedback from the advisory board.
- Yearly reports and policy briefs will summarize the research results
- Scientific papers, workshops disseminating results to a group of stakeholders from the financial and public sector, data providers, and academic community
- Project website including all outputs.
- Project can also develop tailored work for the partners, depending on the budget available and agreement with all consortium members.

3. Team

WUR research team: modelling, environmental economics, cost-benefit analysis:

- **Haki Pamuk, PhD:** Senior researcher and science lead; modelling, data science, cost-benefit analysis
- **Maria Naranjo-Barrantes, PhD:** Senior researcher, project manager environmental economics,
- **Nico Polman, PhD:** Strategic senior researcher; coordinating knowledge development Green Economy and Land
- **Willem-Jan van Zeist, PhD:** Senior researcher; macroeconomic modelling
- **Jean Nel, PhD:** Head of Biodiverse Environment Programme: Biodiversity, ecology
- **Arnold van Vliet, PhD:** Biologist, ecosystem services, scenario building
- **Mieke Siebers, Msc:** Executive director of FSD, Ecosystem services valuation, networking and communication.
- **Marcia, Arredondo Rivera, Msc:** Junior researcher; biodiversity, ecology, environmental economics
- **Jurrian Nannes, Msc:** Junior researcher; environmental economics, data science
- **Koen Leuveld, PhD:** Researcher, data, dashboard building

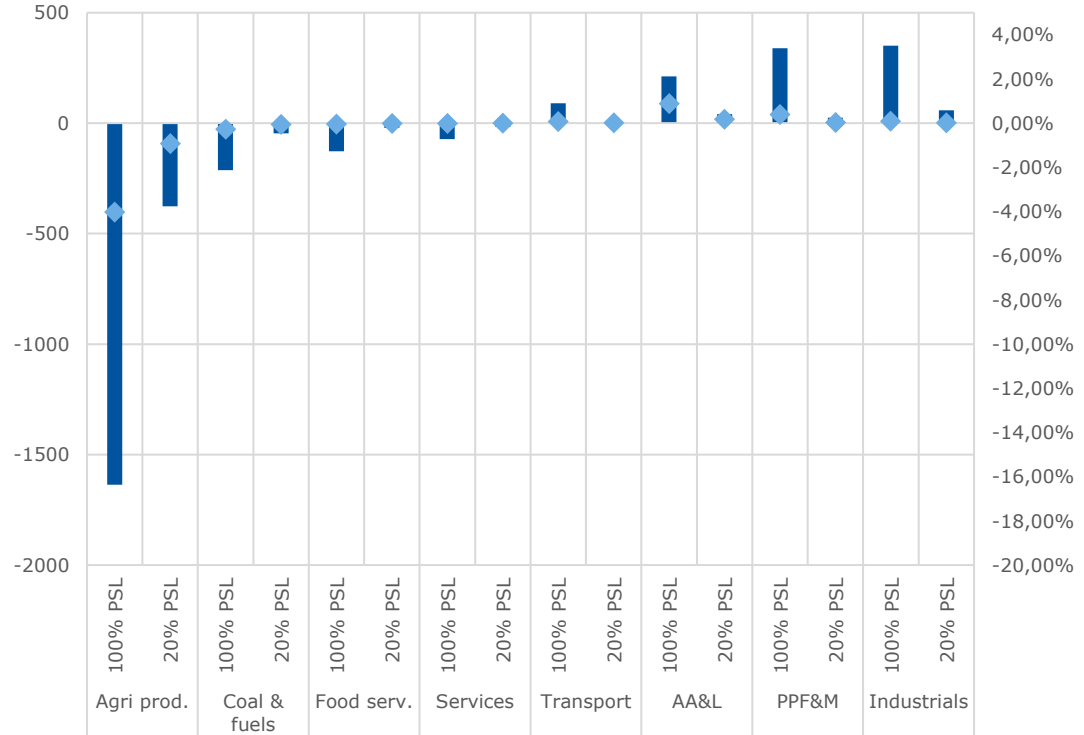
Examples for project results

A snapshot of our existing monetary estimates for PSL in the Netherlands

[Back](#)

- For the Dutch economy, the costs are about 2.1 billion US\$
- For the Netherlands, the sector with the largest impact is agricultural production, followed by "Coal and fuel" and "Food services" 
- The production loss of the agricultural production in NL is estimated to be about 1.6 billion US\$ per year.
- Please see a short summary of our findings [in Allianz note](#)

Figure: Sectoral economic effects of pollination services loss (PSL) in the Netherlands



■ Absolute production change million US\$

◆ % production change

A snapshot of cost-effectiveness estimates for farm management measures in terms of abating PSL

[Back](#)

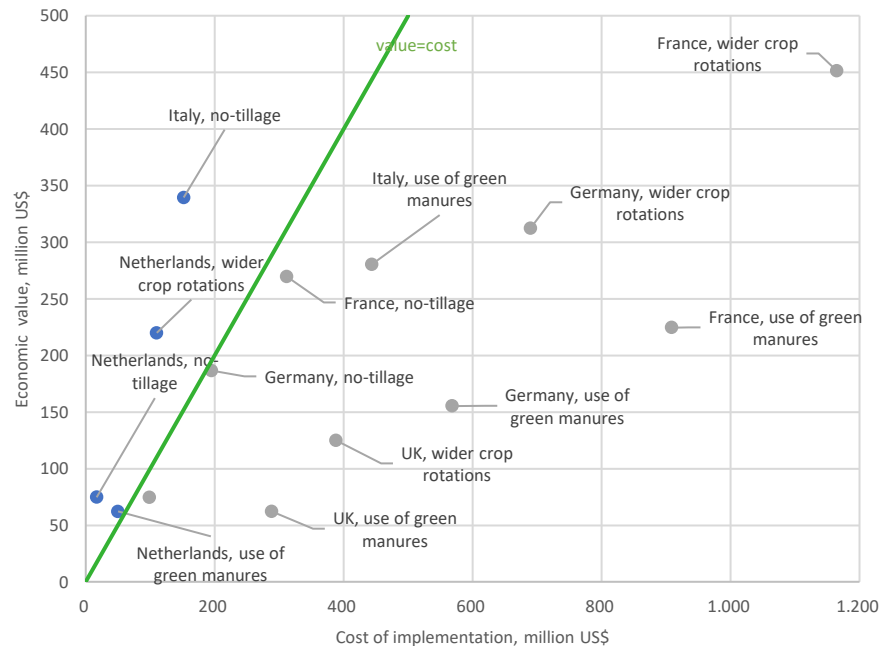
- Cost of implementing different technologies in each country is compared to the economic value of

- abating 11.5% of PSL through wider crop rotation,
- 6.9% of PSL through no-tillage,
- 5.75% PSL through the use of green manure

- Insights on economic viability (left of green line):

- Comprehensive crop rotation and green manure are only economically viable in the Netherlands, not in other countries.
- No-tillage is economically viable in Italy and the Netherlands, but not in France, Germany, or the UK.

Figure: Comparison of cost and economic benefits of farm management measures in terms of abating PSL



Note: To find the corresponding economic of 11.5%, 6.9%, and 5.75% PSL, we assume that the economic value of PSL within 0-10%, and 10%-20% PSL intervals are linearly increasing.

Information about WUR

Wageningen University & Research

Wageningen University

Employees: 2,700
students: > 12,000



Wageningen Research

Employees: 2,600



- Education: BSc, MSc, PhD
- Fundamental and Strategic research
- Scientific Publications: >4.000 p.a.

- Contract Research Organisation
- Applied and Pre-competitive research
- Patents & Licences

Contacts and our biodiversity related projects

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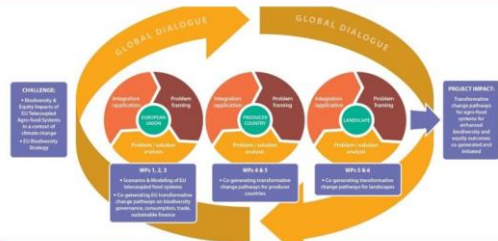
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Transformative change for biodiversity and equity (TC4BE)



Project

Transformative change for
biodiversity and equity (TC4BE)

Biodiversity and transformative change for plural and nature-positive societies (BioTraces)



Transformative pathways

Transformative
Pathways