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Designing policy mixes for coherent water governance

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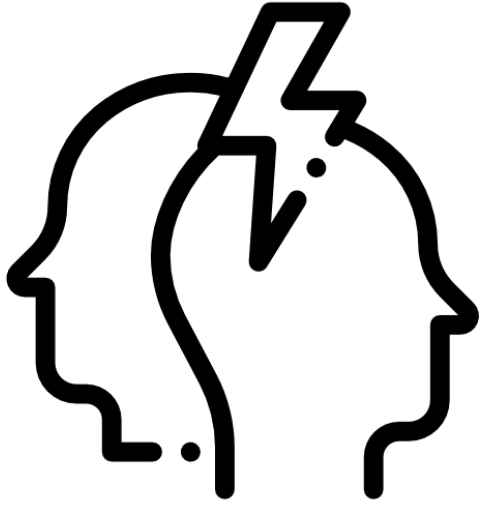
Goal conflicts in water resources management

- **Goal conflicts**
  - **within** the water sector
  - **between** sectors



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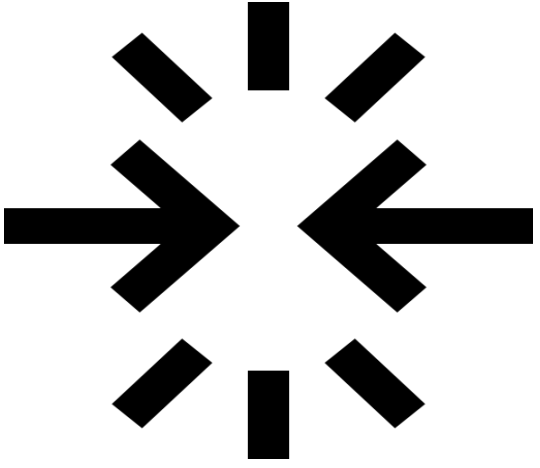
- Goal conflicts as characteristics of **wicked problems** and **sustainability transformations**
- **SDG** (UN 2015) **synergies and trade-offs** (e.g., Nielsson et al. 2016, Weitz et al. 2018, Bennich et al. 2020)
- **Coherent governance for sustainable development?** (e.g., Koff 2021, Nielsson & Weitz 2019)

Policy design to address goal conflicts

- Addressing goal conflicts on the **level of policies**
- **Trade-offs**: individually effective policies hinder each other through side effects
- **Consistency** within sectors and **coherence** between sectors as challenges for **policy design** (e.g., Rogge & Reichhardt 2016, Capano & Howlett 2020, Kirschke & Kosow 2021)



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- **Policy mixes, which address multiple goals, avoid trade-offs, and maximize synergies?**

(Latent) water use conflicts in the Río Lurín catchment, Lima, Peru

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Using Cross-impact balances CIB (Weimer-Jehle 2006) to build and analyze a policy-interaction (PI) model

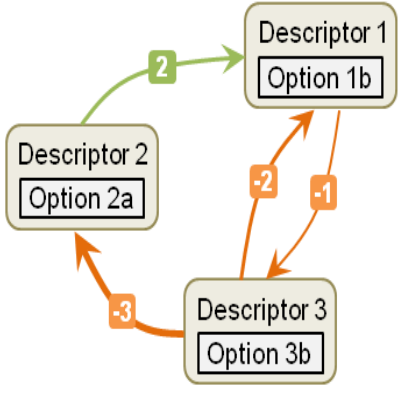
Objectives

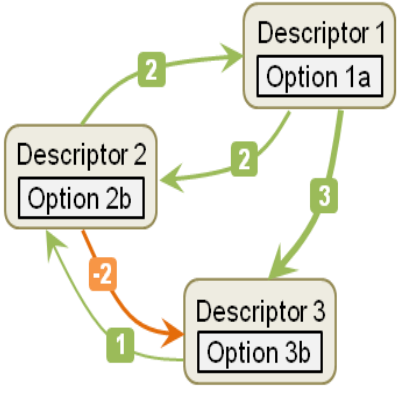
Alternative policies

Interactions

Target → / ↓ Source	D1		D2		D3	
	1a	1b	2a	2b	3a	3b
Descriptor 1						
Option 1a			-1	2	-3	3
Option 1b			0	0	2	-1
Descriptor 2						
Option 2a	-2	2			0	0
Option 2b	2	-2			3	-2
Descriptor 3						
Option 3a	-1	1	0	0		
Option 3b	0	-2	-3	1		

Policy mixes

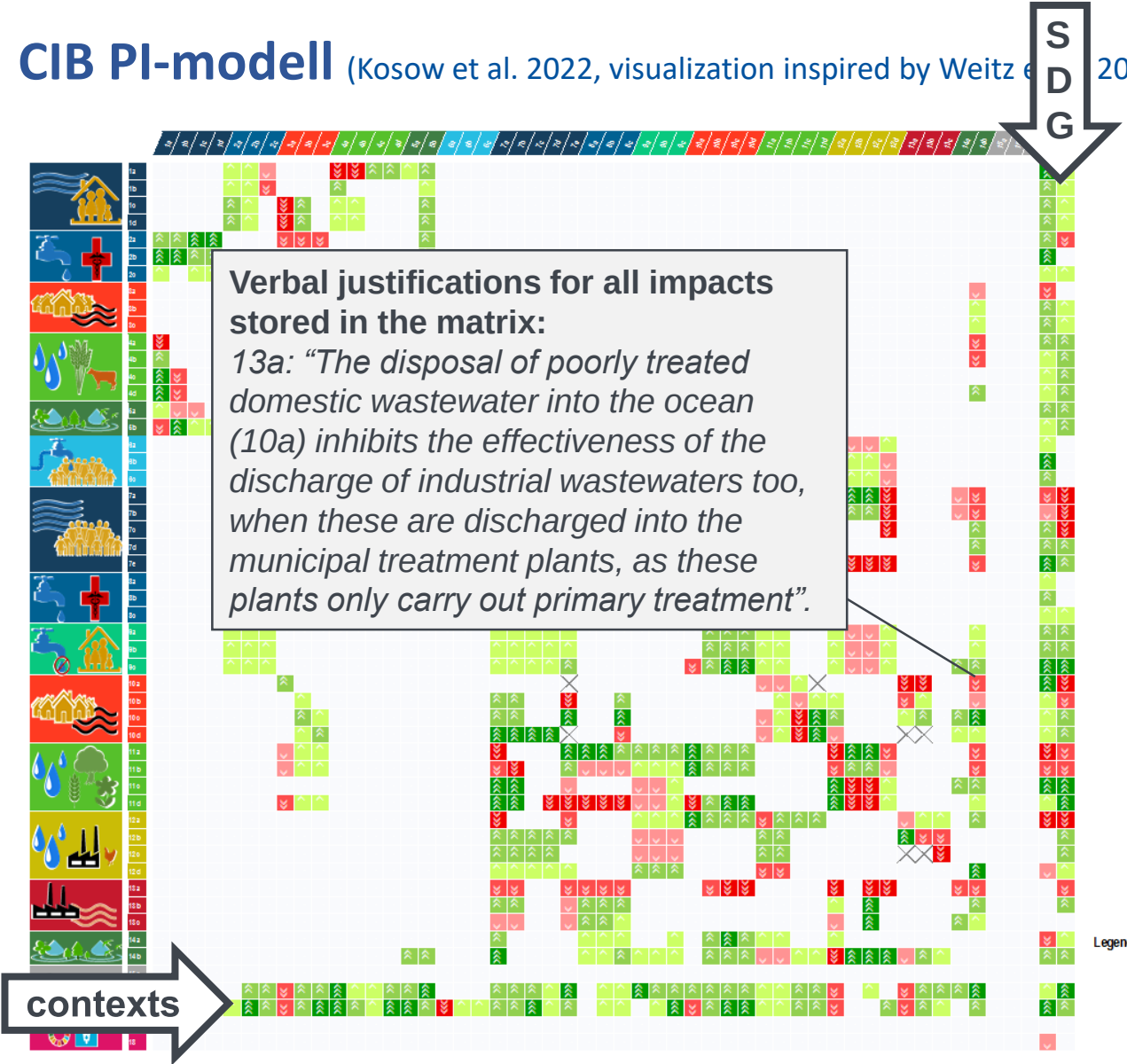




CIB measures → synergetic? consistent?

Adding contexts and criteria → sustainable? robust?

CIB PI-modell (Kosow et al. 2022, visualization inspired by Weitz e 2019)



Verbal justifications for all impacts stored in the matrix:
13a: "The disposal of poorly treated domestic wastewater into the ocean (10a) inhibits the effectiveness of the discharge of industrial wastewaters too, when these are discharged into the municipal treatment plants, as these plants only carry out primary treatment".

14 objectives with in total
n= 47 policies

Cross-impact interviews with experts and stakeholders

Assessing impacts on effectiveness of policies

Impact scale -3 to +3, 0= no impact (Weimer-Jehle 2006) extended by cancelling impacts – 99 (Nielsson et al. 2016)

The status quo mix: main inconsistencies and trade-offs (based on Kosow et al. 2022)

Inconsistent policy = What objective is not optimaly achieved by the chosen policy and why?

main hindering relations

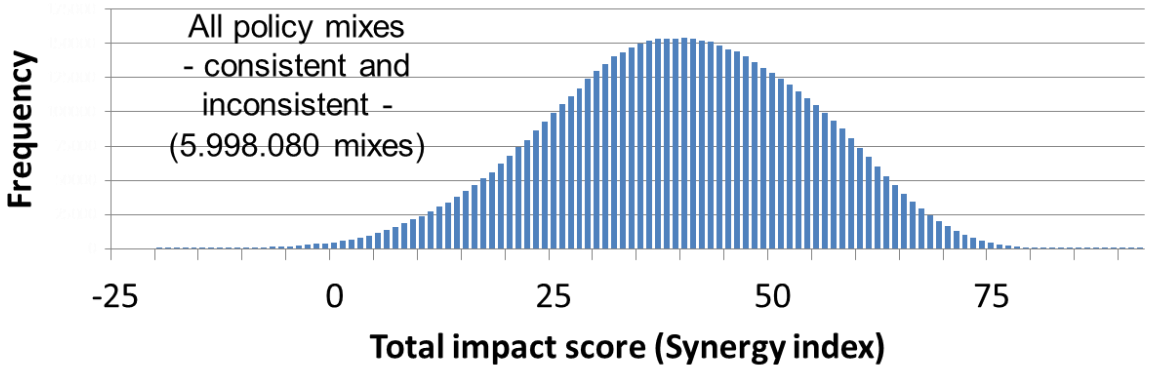
Consistent policy

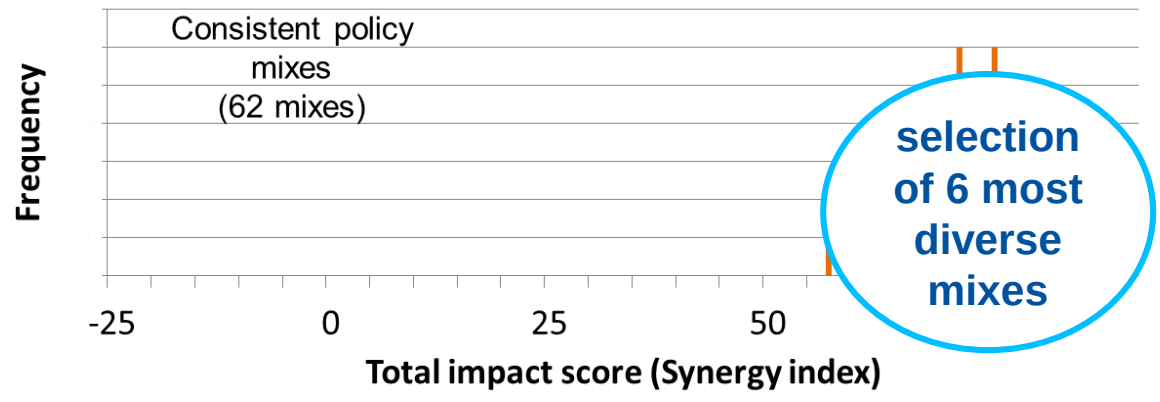
Inconsistent policy distance to policy alternative with highest impact score:

1-3

>3

Identifying synergetic and consistent policy mixes



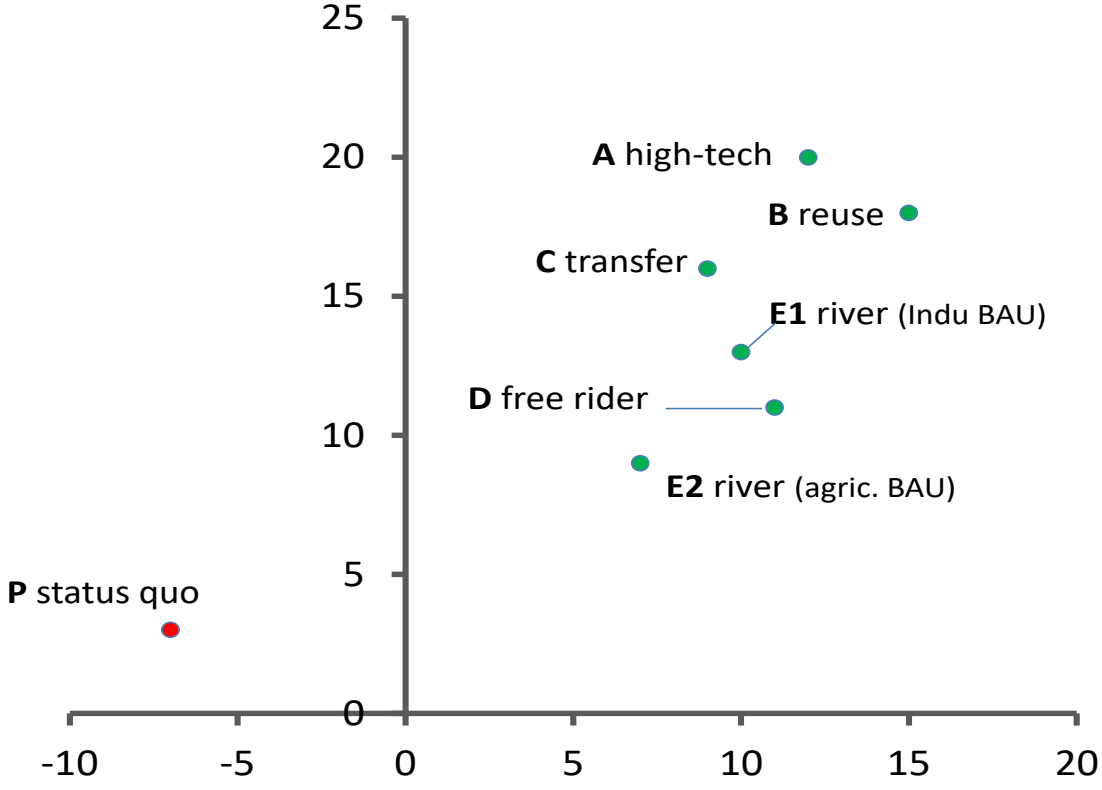


Synergetic mix = How well does a mix benefit from supportive policy interactions? How effective is it?

Consistent mix = What mix is stable, because it optimizes each of its objectives and avoids inner contradictions?

Sustainability of policy mixes (sample of 6 most diverse fully consistent mixes, Kosow et al. 2022)

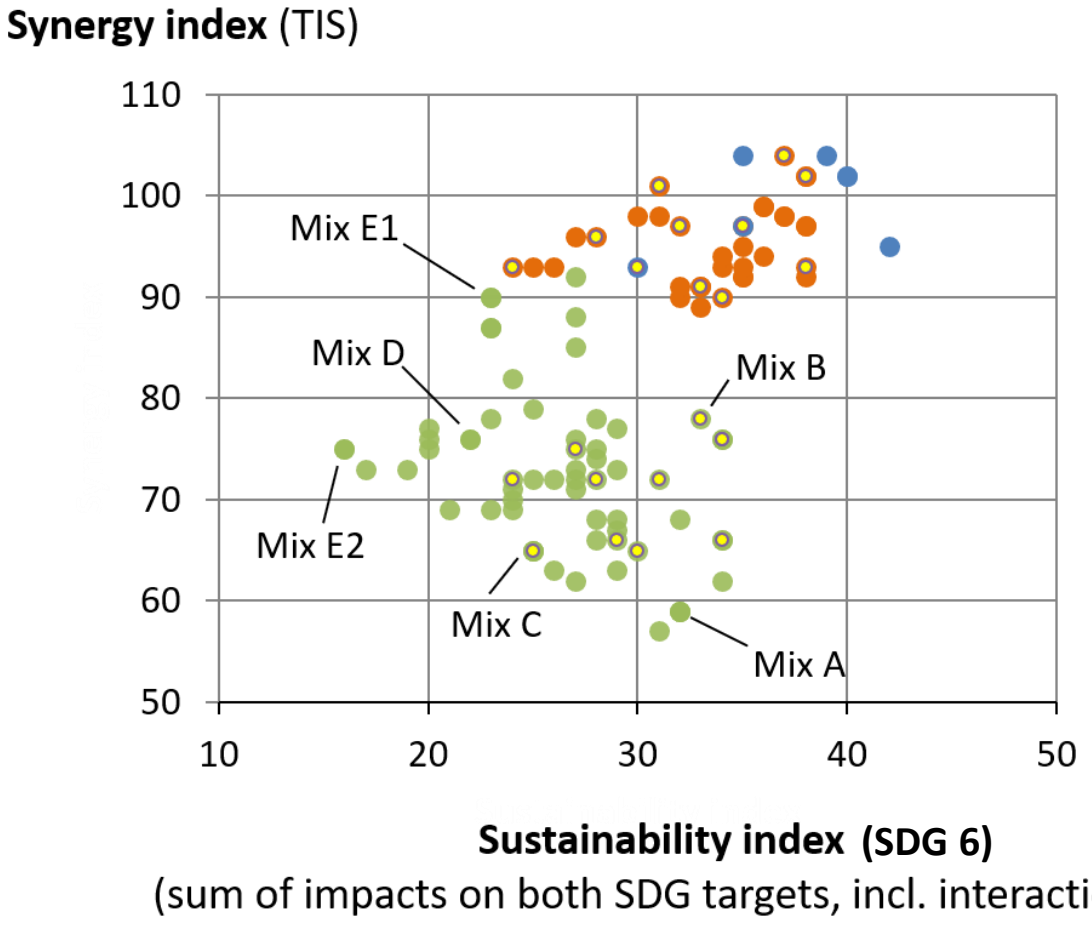
SDG 6.1 Safe drinking water for all (impact score all policies)



Sustainable mix= How well do mixes perform regarding sustainability criteria?

SDG 6.6 conserving water related ecosystems (impact score all policies)

Robustness of policy mixes (Kosow et al. 2022)



- Governance as usual
- Improved authority
- Improved concertation

Robust mix= What mixes are consistent under different context assumptions?

- Robust under different Governance assumptions

Application in Lurín: expert and stakeholder participation

I. Selection and definition **of objectives and policies** with experts and stakeholders

II. Interviews on **policy interactions** with technical and local experts

III. Transfer of results to stakeholders working on a **water use strategy** for Lurín, Lima, Peru

Summary

- Methodology to design and evaluate (ex post und ex ante) policy mixes through policy interaction modeling
- Base: Cross-Impact-Balances (CIB), a qualitative systems analysis
- Easy operationalization of synergy and consistency
- Assessing sustainability effects and robustness of policy mixes
- Explicitly addressing goal conflicts within the water sector and between sectors
- Contributing to a more coherent water resources governance

Thank you very much!

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Free CIB software: www.cross-impact.de

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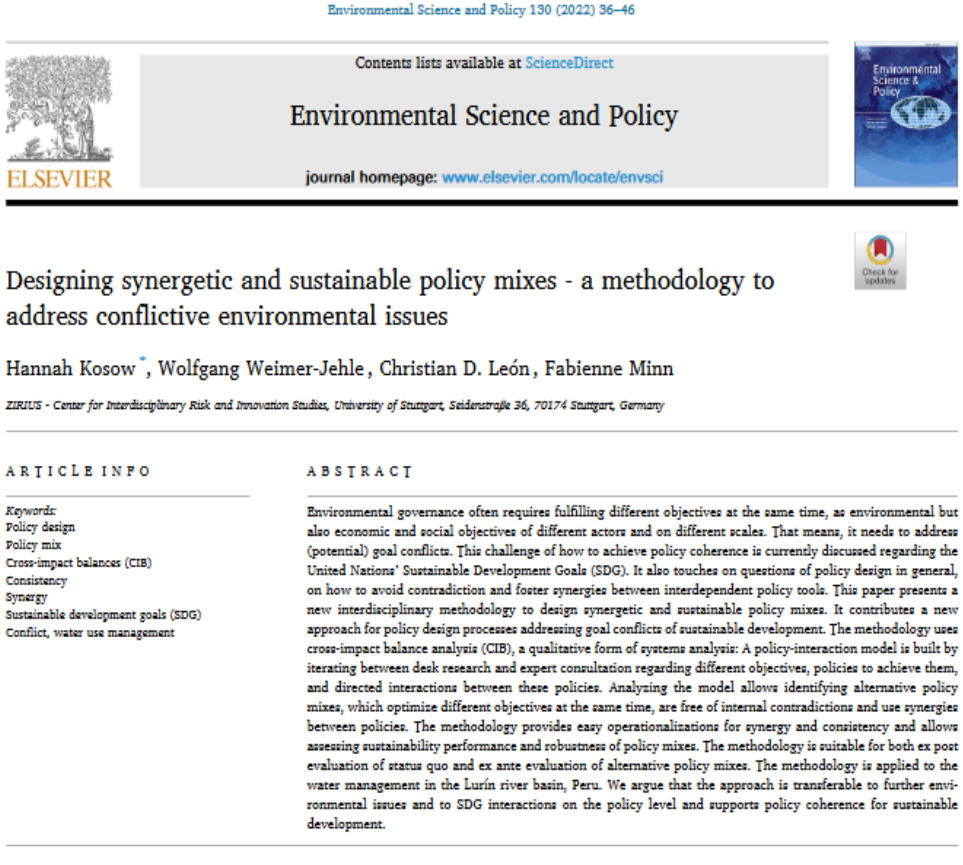

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Designing synergetic and sustainable policy mixes - a methodology to address conflictive environmental issues

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ABSTRACT

Environmental governance often requires fulfilling different objectives at the same time, as environmental but also economic and social objectives of different actors and on different scales. That means, it needs to address (potential) goal conflicts. This challenge of how to achieve policy coherence is currently discussed regarding the United Nations' Sustainable Development Goals (SDG). It also touches on questions of policy design in general, on how to avoid contradiction and foster synergies between interdependent policy tools. This paper presents a new interdisciplinary methodology to design synergetic and sustainable policy mixes. It contributes a new approach for policy design processes addressing goal conflicts of sustainable development. The methodology uses cross-impact balance analysis (CIB), a qualitative form of systems analysis: A policy-interaction model is built by iterating between desk research and expert consultation regarding different objectives, policies to achieve them, and directed interactions between these policies. Analyzing the model allows identifying alternative policy mixes, which optimize different objectives at the same time, are free of internal contradictions and use synergies between policies. The methodology provides easy operationalizations for synergy and consistency and allows assessing sustainability performance and robustness of policy mixes. The methodology is suitable for both ex post evaluation of status quo and ex ante evaluation of alternative policy mixes. The methodology is applied to the water management in the Lurín river basin, Peru. We argue that the approach is transferable to further environmental issues and to SDG interactions on the policy level and supports policy coherence for sustainable development.

León, C. D., Brauer, F., Hügler, M., Keller, S., Kosow, H., Krauss, M., Wasielewski, S., & Wienhöfer, J. (Eds.) (2021). Integrated Water Management Solutions in the Lurín Catchment, Lima, Peru – Supporting United Nations' Sustainable Development Goal 6. http://dx.doi.org/10.18419/opus-11390

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