United Nations University
Institute for Environment and Human Security

WIM ExCOM 24
Agenda item 6: How the latest climate science can inform policy-making relevant to averting, minimizing, and addressing loss and damage
Bonn, 30.04.2026

Losses and damages of biodiversity and ecosystem services

Scientific evidence, gaps, advances and synergies

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Losses and damages of biodiversity and ecosystem services

https://www.theatlantic.com/photo/2012/12/typhoon-bopha/100421/

https://byjus.com/biology/ecosystem/
https://www.eurekalert.org/multimedia/710647

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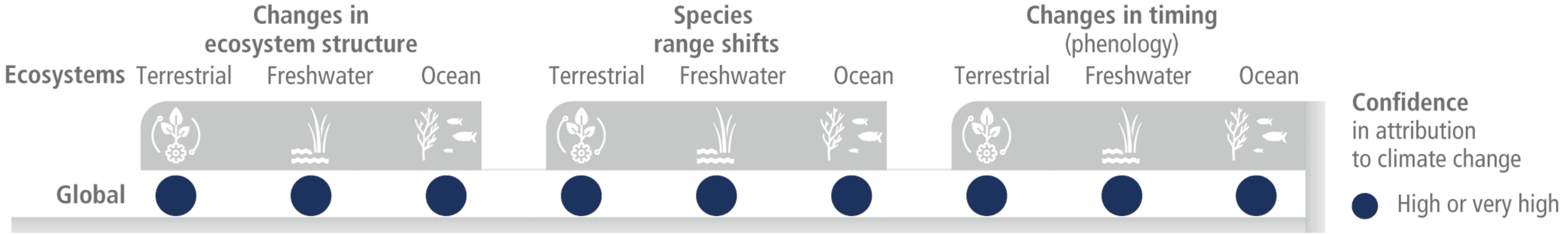
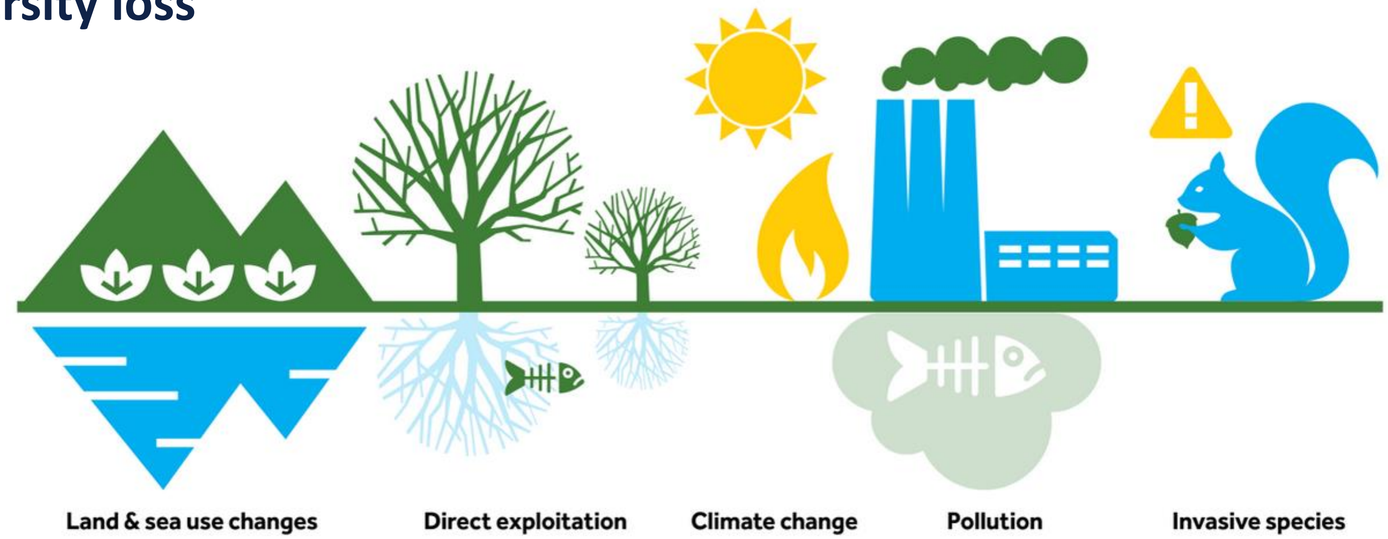
Scientific evidence

Observed impacts of climate change on ecosystems



Source: IPCC, 2022

Key drivers of biodiversity loss



Source: IPBES, 2019

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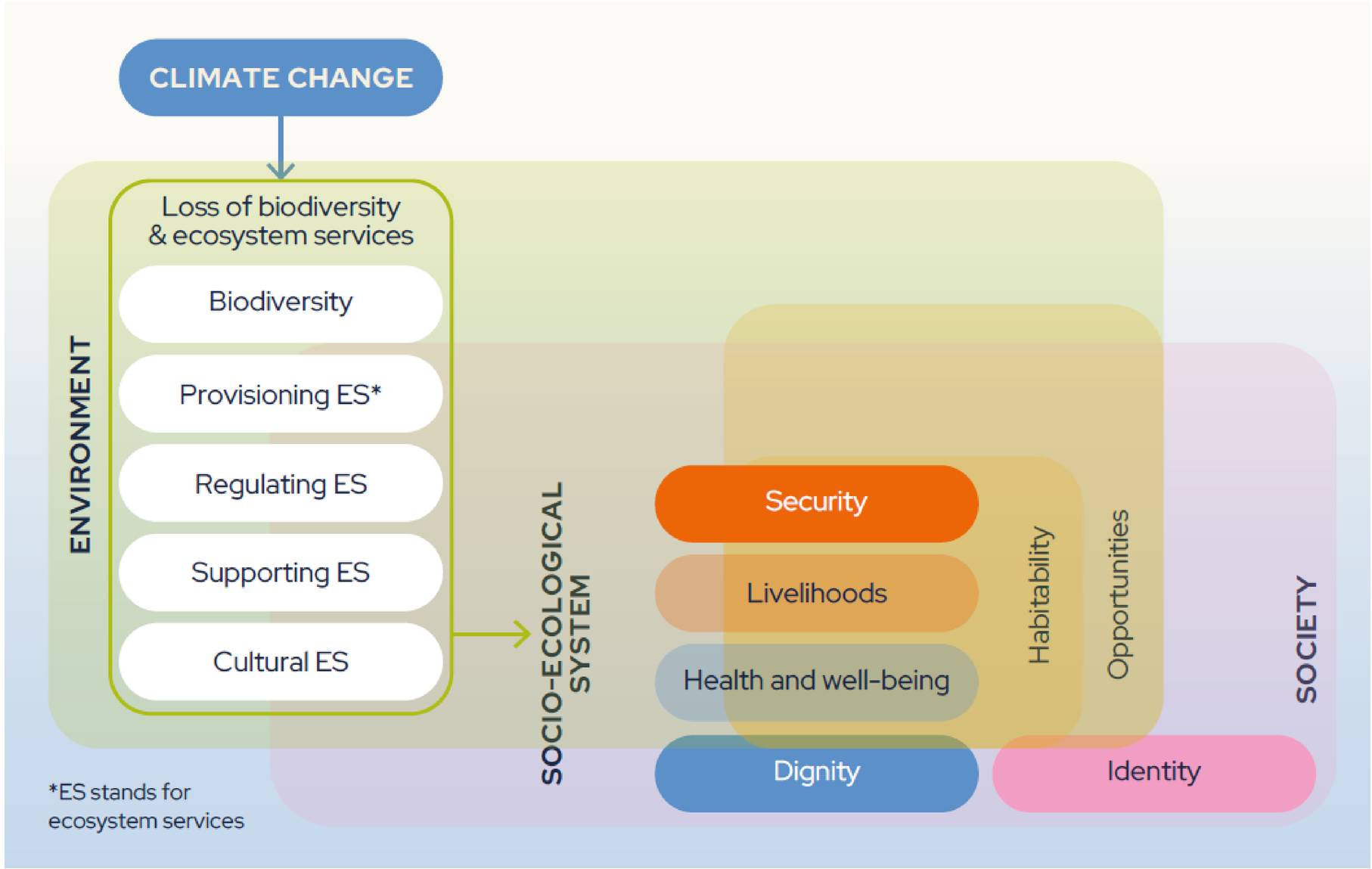
Why losses of biodiversity and ecosystem services matter?



Source: UNFCCC 2024

Losses of biodiversity and ecosystem services – A real-world example

Coral bleaching caused by increasing temperatures, Vanuatu

"We are experiencing **coral bleaching** in some areas and communities. This has [a] huge **impact on coastal fisheries and livelihood[s]**."

"Nowadays, because the coral reefs are dying, the fish have gone. Our **coastal waters have less and less to provide**, all that's left is dead limestone and seaweed […] We have had to **spend more money on food** now than we ever did in the past. In the future I do not expect for there to be anything left in the waters or in the bush. The **knowledge** that my grandparents passed onto my cousins and I about which plants to eat in the bush or which fish is safe to eat will die with my generation"

Stephans et al. 2023

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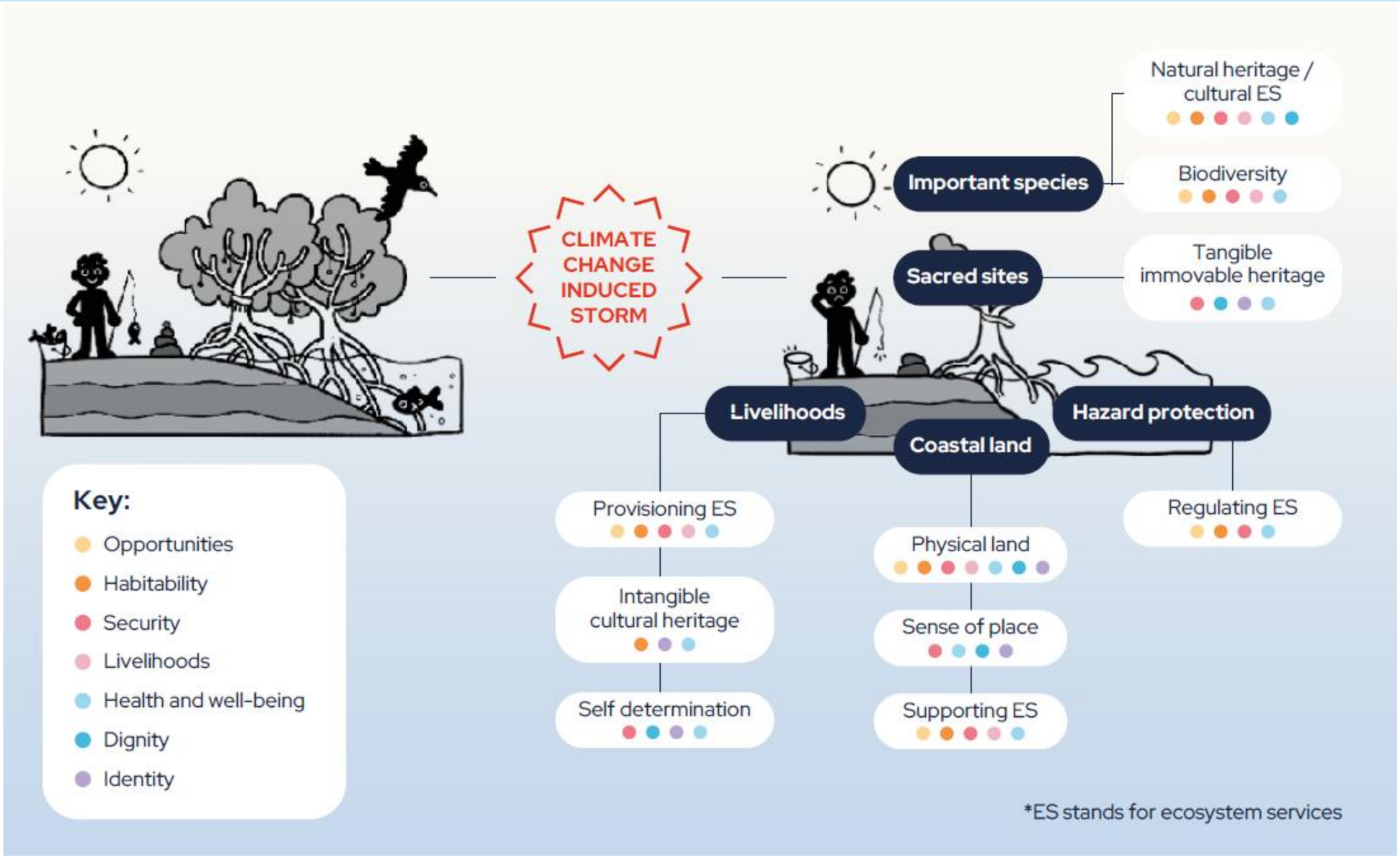
Example: Cascading losses of an impacted coastal forest



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Source: UNFCCC 2024

Bonn Technical Forum: Beyond economic losses

UNDRR Bonn Technical Forum

Beyond economic losses: towards a holistic approach on tracking losses and damages

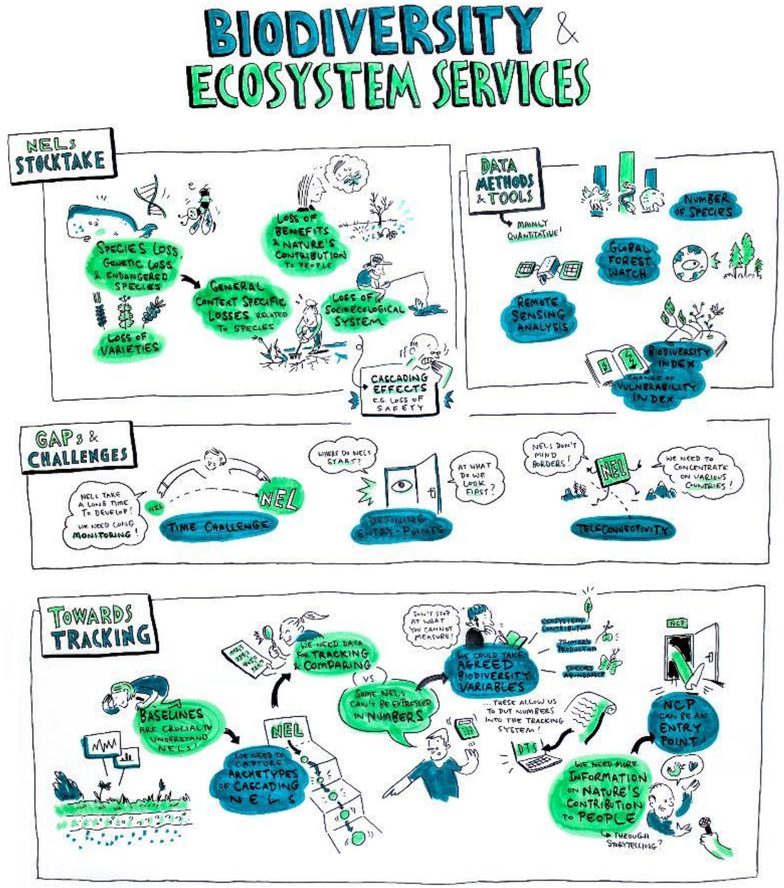

Photo credit: UNDRR/ Sebastian Loerscher

Gaps

Attribution to climate vs. other stressors unclear

- Multiple, overlapping drivers make isolation of climate impacts complex.

Lack of standardized metrics (esp. for non-economic losses)

- Cultural, spiritual, and relational losses are hard to quantify and compare.

Lack of monitoring: spatial, temporal, baseline gaps

- Incomplete data and infrequent observations hinder trend detection.

Ecological vs. policy scale mismatch

- Ecological changes unfold on timescales and areas not matched by policies.

Capacity and data limitations, especially in least developed regions

- Limited resources impede monitoring, reporting, and loss valuation.

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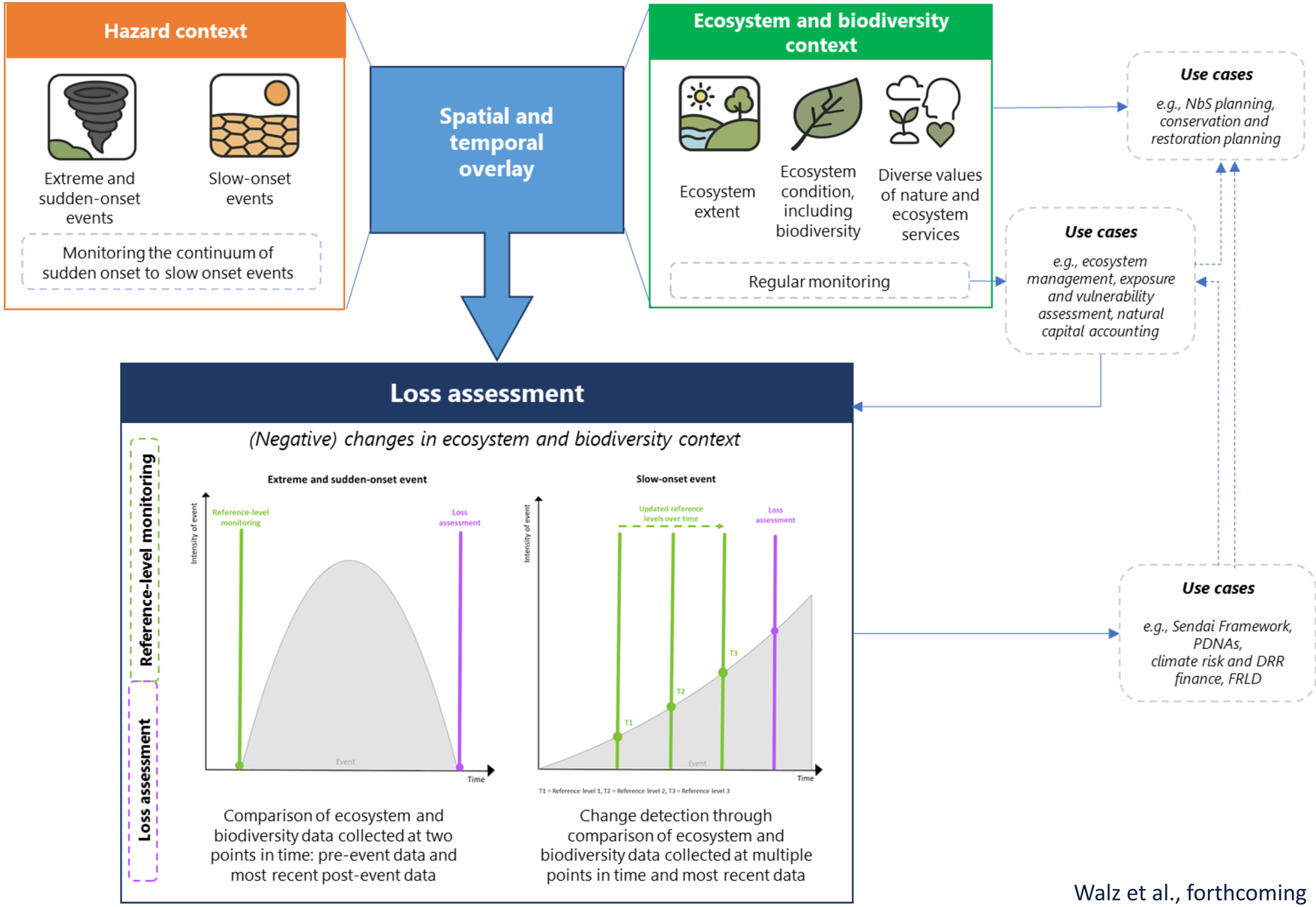
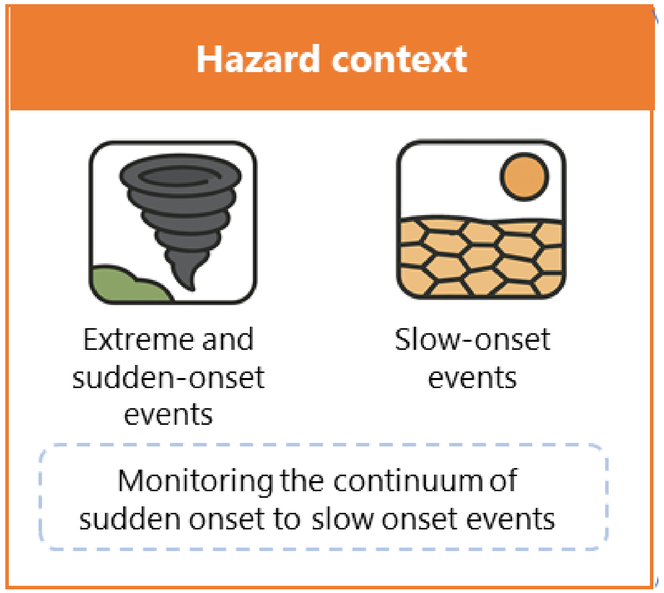
Framework to assess losses of biodiversity and ecosystem services



Walz et al., forthcoming

Funded by

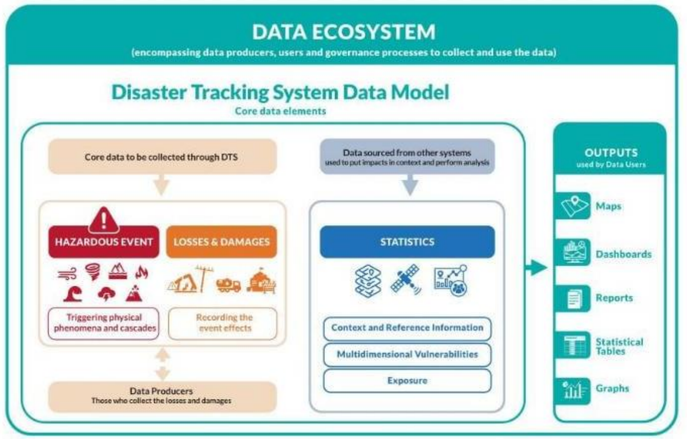
Monitoring climate and hazardous events



Monitoring and assessment of

- spatial extent of the event(s) in question (e.g., size of the inundated area after a flood)
- hazard characteristics (e.g., wave height (storm surges) or temperature and soil moisture (drought))

Synergies with UNDRR's DELTA Resilience System



Walz et al., forthcoming

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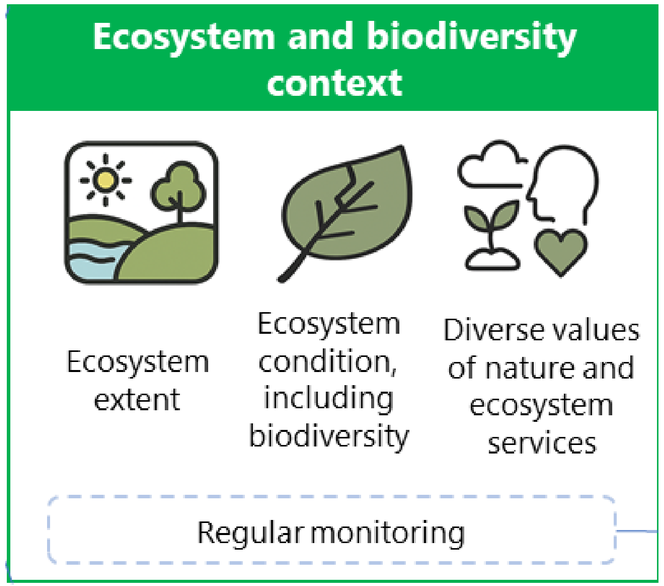
Monitoring the ecosystem and biodiversity context



- **Extent and condition** of ecosystems, including biodiversity, are fundamental for their functioning
- Any reduction of extent and deterioration of condition can have palpable effects on the composition of biotic and abiotic elements and the flows of energy and materials
- This determines an ecosystem's capacities to provide **diverse values and ecosystem services** to different groups of people

Walz et al., forthcoming

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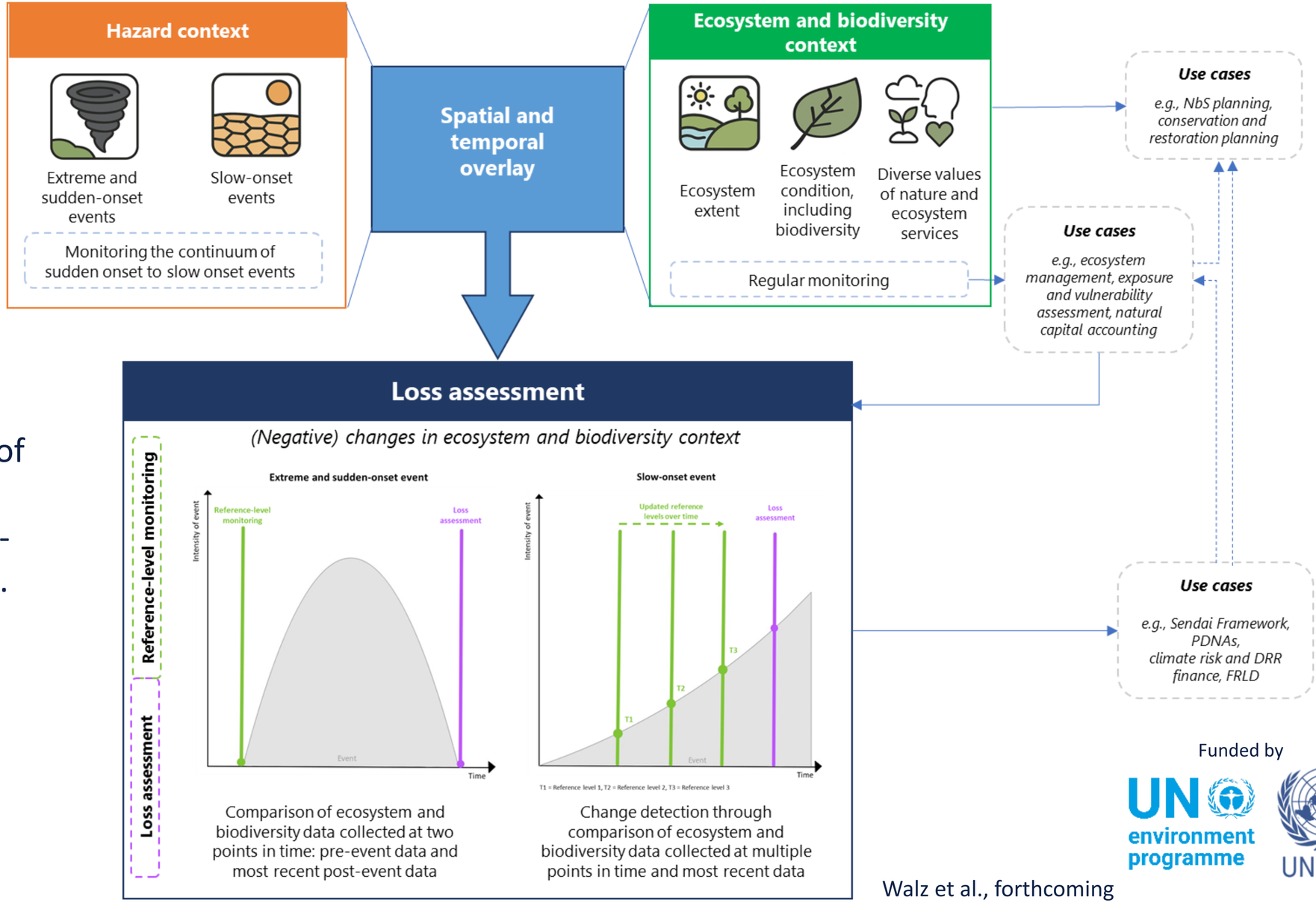
Assessing losses of biodiversity and ecosystem services



- comparison of the state of the ecosystem and biodiversity context post-event to a previous state.
- requires reference level data and reference level monitoring.

Walz et al., forthcoming

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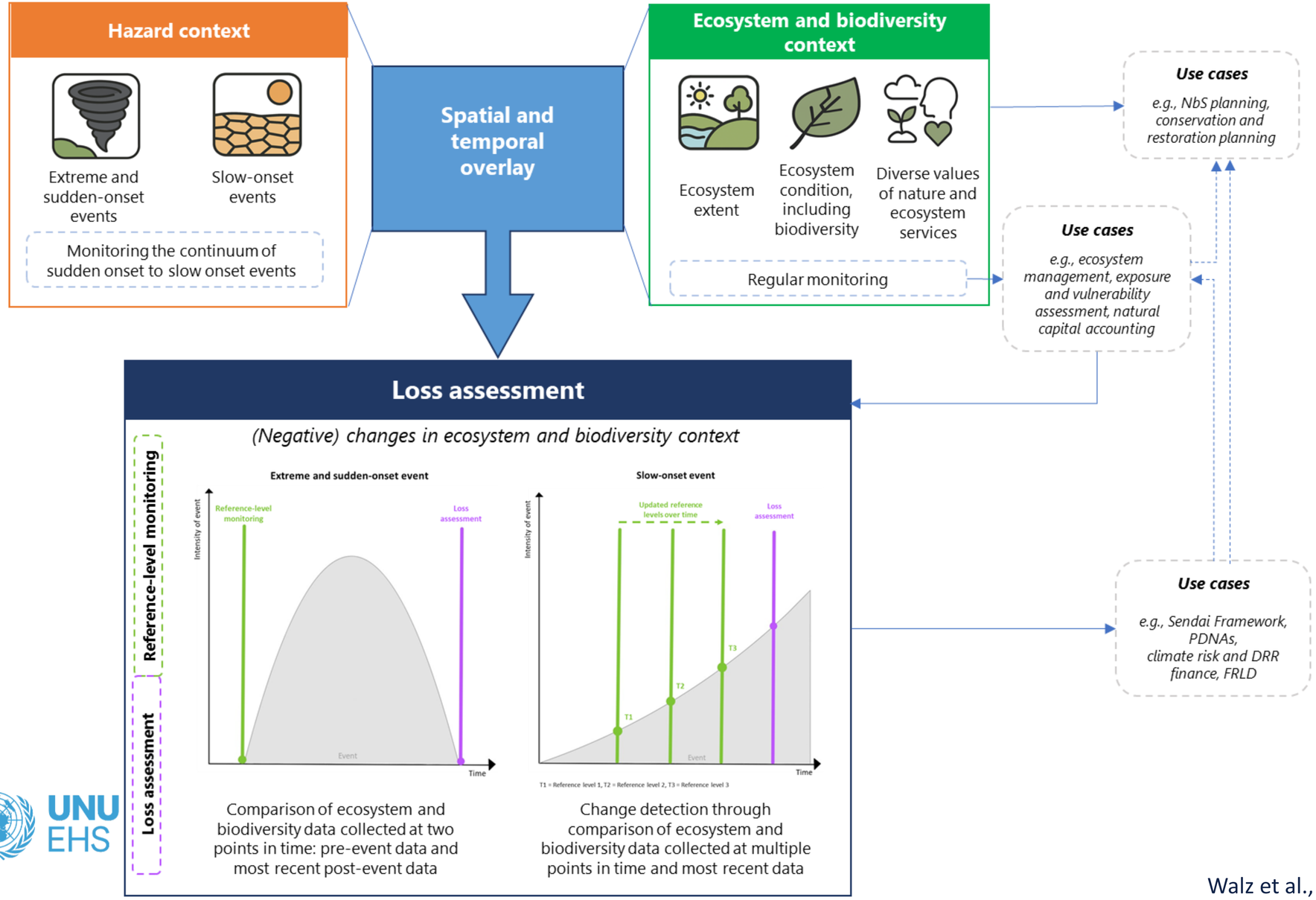
Use cases of the framework



Monitoring the ecosystem and biodiversity context

- NbS planning
- Planning of restoration and/or conservation
- Assessment of exposure and vulnerability in the context of risk assessment
- Reference level monitoring
- Natural capital accounting

Loss assessment

- Inform the Sendai Framework monitor
- Climate and DRR finance
- L&D fund

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Walz et al., forthcoming

Leveraging synergies at the policy level through national policy instruments

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POLICYBRIEF
No. 15, 2024

Ecosystem-based approaches for integrating disaster risk reduction, climate, land and biodiversity goals

Yvonne Walz, Lisa Hartmann, Sally Janzen, Jack O'Connor, Fabian Rackelmann, Marisol Estrella, Chawanangwa Nyirenda, Sandra Amlang, Kristin Meyer, Iria Touzon Calle, Veronica Ruiz Garcia, Dorsa Sheikholeslami, Jeroen Jurriens, Heidi Tuhkanen, Irfan Maqbool, Nidhi Nagabhatla, Johann Georg Goldammer, Nathalie Doswald, Karen Sudmeier-Rieux

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Convention or Framework	Selected goals, targets a
CBD	**Kunming-Montreal Globa** • Target 8: Minimize the Ir … disaster risk reduction based approaches" • Target 11: Restore, Maint solutions and/or ecosyst **Decision XII/20 of CBD C** "governments and relevant approaches to climate ch
UNCCD	**UNCCD 2018–2030 Strat** • Para. 5, Strategic objecti desertification/land degr degradation neutrality" • Para. 9 (j): "Implement re of ecosystem functions a **Decision 8/COP.15**: "explo Agreements, within their r United Nations Convention in the implementation of s based solutions"
UNFCCC	**Paris Agreement** • Article 5 (1): "conserve ar including forests" • Article 7 (9e): "building … **Sharm el-Sheikh Implem** nature-based solutions or action"
Sendai Framework	**Sendai Framework for Di** • Para. 28 (d): "To promote implementation of ecosy • Para. 30 (n): "To strengt integrated environmenta risk reduction" Political declaration of the (**A/RES/77/289**), para 26 (for disaster risk reduction

Convention/ Framework	National-level instruments	Examples of guidance and strategies on leveraging synergies
CBD	**National Biodiversity Strategies and Action Plans (NBSAPs)**	**To integrate disaster risk reduction:** • Strengthening Disaster Risk Reduction in National Biodiversity Strategies and Action Plans: Recommendations and Guidance for Governments (UNDRR, 2024) **To integrate climate change mitigation and adaptation:** • Promoting Synergies Between Climate Change Adaptation and Biodiversity (UNFCCC et al., 2022) **To integrate achieving land degradation neutrality:** • Land Degradation Neutrality for Biodiversity Conservation: How healthy land safeguards nature (UNCCD et al., 2019a)
UNCCD	**National Action Plans** **Land Degradation Neutrality (LDN) Target Setting Programme** **National Drought Plans**	**To integrate disaster risk reduction:** • Drought resilience, adaptation and management policy framework: Supporting technical guidelines (UNCCD et al., 2019b) **To integrate biodiversity conservation:** • Land Degradation Neutrality for Biodiversity Conservation: How healthy land safeguards nature (UNCCD et al., 2019a) **To integrate climate change mitigation and adaptation:** • Promoting synergies between land degradation neutrality and climate change adaptation (UNCCD and UNU-EHS, forthcoming)
UNFCCC	**Nationally Determined Contributions (NDCs)** **National Adaptation Plan (NAPs)**	**To integrate disaster risk reduction:** • Nature-based solutions for comprehensive disaster and climate risk management (UNDRR and UNU-EHS, 2023) **To integrate biodiversity conservation:** • Promoting Synergies Between Climate Change Adaptation and Biodiversity (UNFCCC et al., 2022) **To integrate achieving land degradation neutrality:** • Promoting synergies between land degradation neutrality and climate change adaptation (UNCCD and UNU-EHS, forthcoming)
Sendai Framework	**National and local disaster risk reduction strategies**	**To integrate biodiversity conservation:** • Words into Action: Nature-based Solutions for Disaster Risk Reduction (UNDRR, 2021b) **To integrate climate change mitigation and adaptation:** • Promoting synergy and alignment between Climate Change Adaptation and Disaster Risk Reduction in the context of National Adaptation Plans (UNDRR, 2021a) **To integrate achieving land degradation neutrality and address droughts:** • Drought resilience, adaptation and management policy framework: Supporting technical guidelines (UNCCD et al., 2019b)

Ecosystem-based approaches as connector

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Walz et al., 2024

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Thank you for your interest!

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