Figure 1

Integration of Climate Change Mitigation and Adaptation

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Outline

- Why Integrate Mitigation and Adaptation?
- Examples of integration approaches
- Challenges to integration
- Recommendations for integration
- Conclusion
- References
- Discussion

Figure 1

Why Integrate Mitigation and Adaptation?

- **Rising global temperatures** mean adaptation is necessary, even with net zero by 2050
- **Separate approaches** not cost-effective, slow progress, create inefficiencies and can undermine local efforts
- **Strengthening** of mitigation on adaptation or vice versa
- **Synergy**, i.e. strengthening of both

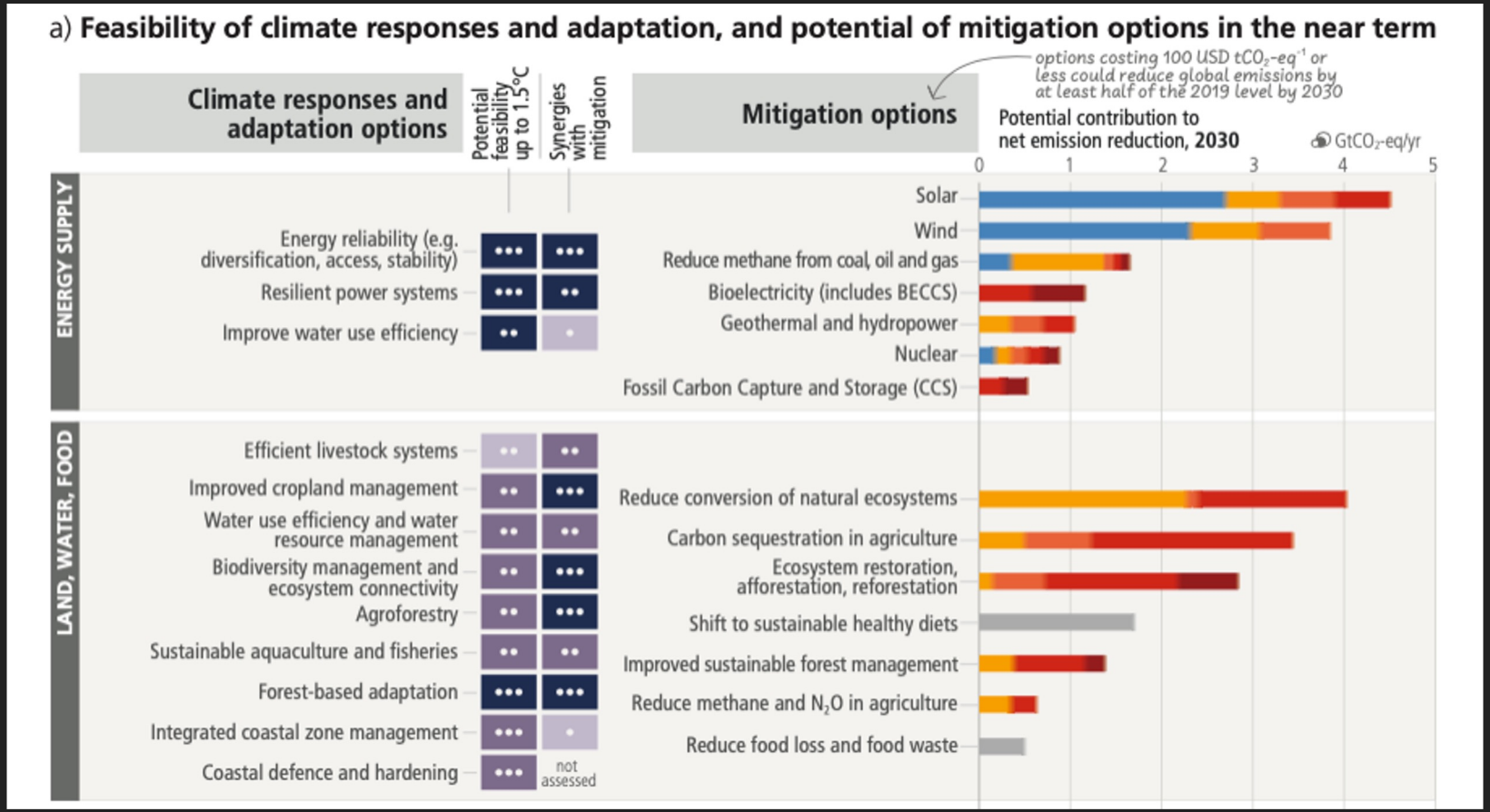
Howarth & Robinson, 2024; IPCC, 2023; Locatelli et al., 2015

Why Integrate Mitigation and Adaptation?

Common concerns & shared but differentiated responsibility:

- Mitigation on global level, adaptation often local
- Different countries have unique priorities and challenges
- Prioritizing equity, climate justice, social justice, and fair transition processes is essential

Howarth & Robinson, 2024; IPCC, 2023; Locatelli et al., 2015



Multiple options for scaling up climate action. Figure excerpt from *IPCC, 2023*

Integration Example:

Low Carbon Diet and Climate-Smart Agriculture

- Reduces emissions of carbon & methane from food systems
- Increases resilience of food production systems to e.g. droughts
- Improves livelihood & food security

Howarth & Robinson, 2024

Figure 2

Integration Example:
Mangrove Forests

- Carbon capture & storage
  (up to 4x as much as other tropical forests!)
- Coastline stabilisation
- Storm surge & flood protection
- Marine biodiversity conservation
- Livelihood diversification

Barnes, 2022; Howarth & Robinson, 2024

Figure 3

Integration Example:
Sponge Cities

- Reduces urban floodings
- Enhances urban cooling
- Increases carbon sequestration
- Reduces energy use

Boncheva, 2022; Shao et al., 2018

Figure 4

An Integrative Narrative
Climate (Smart) Landscapes

Landscape design and management *as integrated adaptation & mitigation strategies that target the* ***complex interrelationships*** *of vegetation, soils, water & climate through forestry, agriculture, animal husbandry, and water management*

Locatelli et al., 2015; Schwarzer et al., 2025

Figure 5

An Integrative Narrative
Climate (Smart) Landscapes

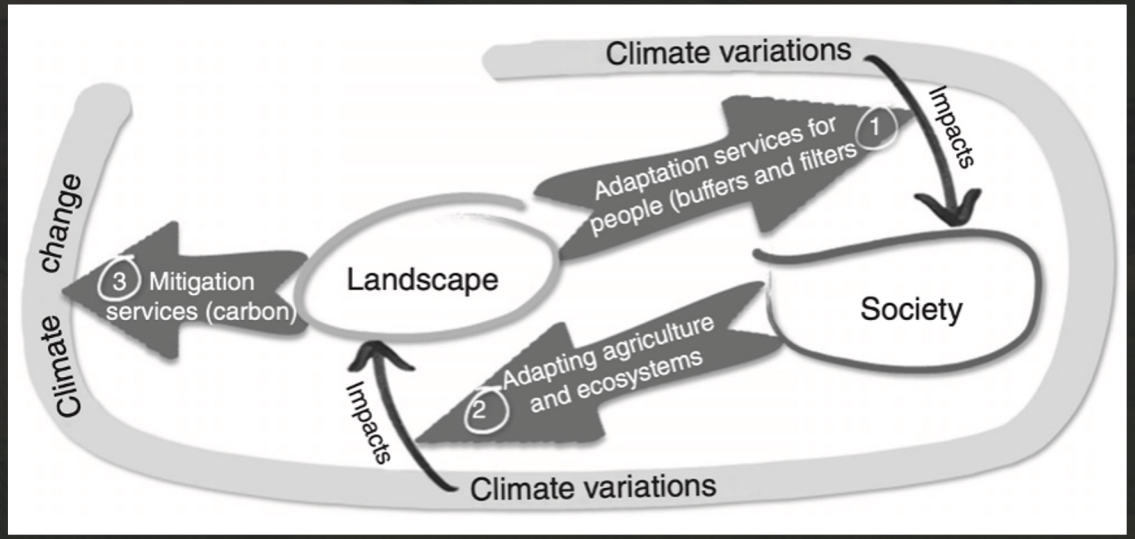


Fig 6.

Figure 5

Challenges of Integrating Mitigation and Adaptation

- **Different mechanisms & scales** for monitoring, supporting, financing
- Climate action **differs across countries**
- Lack & inequality in **funding & innovation**
- **Mitigation prioritized** over adaptation
- Nationally & regionally climate action (often) **lacks coherence**
- **Weakening** & **competition** effects

Howarth & Robinson, 2024; Locatelli et al., 2015

Figure 1

Recommendations for Integrating Mitigation and Adaptation

- Change should be **intersectional**
- Inclusive **policy &** committed **regulation**
- **Finance, tech, and info** collaboration
- Adaptive **framing & contextualisation**
- Policy **capacity enhancement**
- Multi-level **social mandate development**

Howarth & Robinson, 2024; IPCC, 2023

Figure 1

Conclusion

- Climate challenges are **interconnected** - mitigation & adaptation must be, too
- **Nature-based solutions** support both mitigation & adaptation
- **Smart planning and innovation** can reduce emissions while protecting communities
- A changing climate demands a **changing mindset**
- The future depends on integrating solutions for **prevention and anticipation** - not just responding to crises

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Image References

- Figure 1) Hillside Village in the Mist. *From* Climate Landscapes (2025) Subscription for newsletter. Accessed last on March 202, 25 via https://climate-landscapes.org/newsletter/
- Figure 2) Coffee bushes in a shade-grown plantation in the Andes, Ecuador. *From* Morley Read/Shutterstock *via* van Noordwijk, M. (2019) Agroforestry at 40: how tree-farm science has changed the world. Accessed last on March 202, 25 via https://theconversation.com/agroforestry-at-40-how-tree-farm-science-has- changed-the-world-117090
- Figure 3) Mangrove with aerial roots and pneumatophores along the West coast of Madagascar. *From* Barnes, E. (2022). Mangroves as a solution to the climate crisis. Last accessed on March 20, 2025 via https://www.worldwildlife.org/stories/mangroves-as-a-solution-to-the-climate-crisis
- Figure 4) An example of a true sponge city project. Sanya Dong'an Wetland Park, Sanya, Hainan Province, China / Turenscape. *From* Green, J. (2021) Kongjian Yu Defends His Sponge City Campaign. Last accessed on March 20, 2025 via https://dirt.asla.org/2021/08/04/kongjian-yu-defends-his-sponge-city-campaign/
- Figure 5) Mosaic Landscape. *From* chwarzer, S., Böhm, C., Löwenstein, F., Senger, C., Braun, S., Klotz, S., Schultze, J.G., Franke, S., Vespermann, J., Diestel, H. (2025). Climate Landscapes. Last accessed on March 20, 2025 via https://climate-landscapes.org
- Figure 6) Conceptual framework of the integration of adaptation and mitigation into landscape management. *From* Locatelli, B., Pavageau, C., Pramova, E., & Di Gregorio, M. (2015) Integrating climate change mitigation and adaptation in agriculture and forestry: opportunities and trade-offs. WIREs Climate Change, 6: 585–598. doi: 10.1002/wcc.357

Discussion:

- Which actor(s) should take the lead in the process of integrating mitigation & adaptation?
  - *e.g. integrating more efficient water use with hydropower as an energy source*
- What responsibility do developed countries have in supporting developing countries with climate action?
- What could be everyday actions that integrate both mitigation and adaptation?