Equitable development pathways and integrative solutions for resilient futures

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Point 1: Adaptation interventions have many benefits, across multiple dimensions, and research and innovation should continue documenting those benefits rigorously, but there are methodological challenges in linking adaptation outcomes to climate risk reduction – another focus of research.

Point 2: Clear evidence that effectiveness of many adaptation declines at higher levels of global warming – hence important to link adaptation with temperature goals.

Point 3: There are various options of adaptation which also have mitigation co-benefits, but many of those are not cost-effective yet – R&D needed for increasing cost-effectiveness

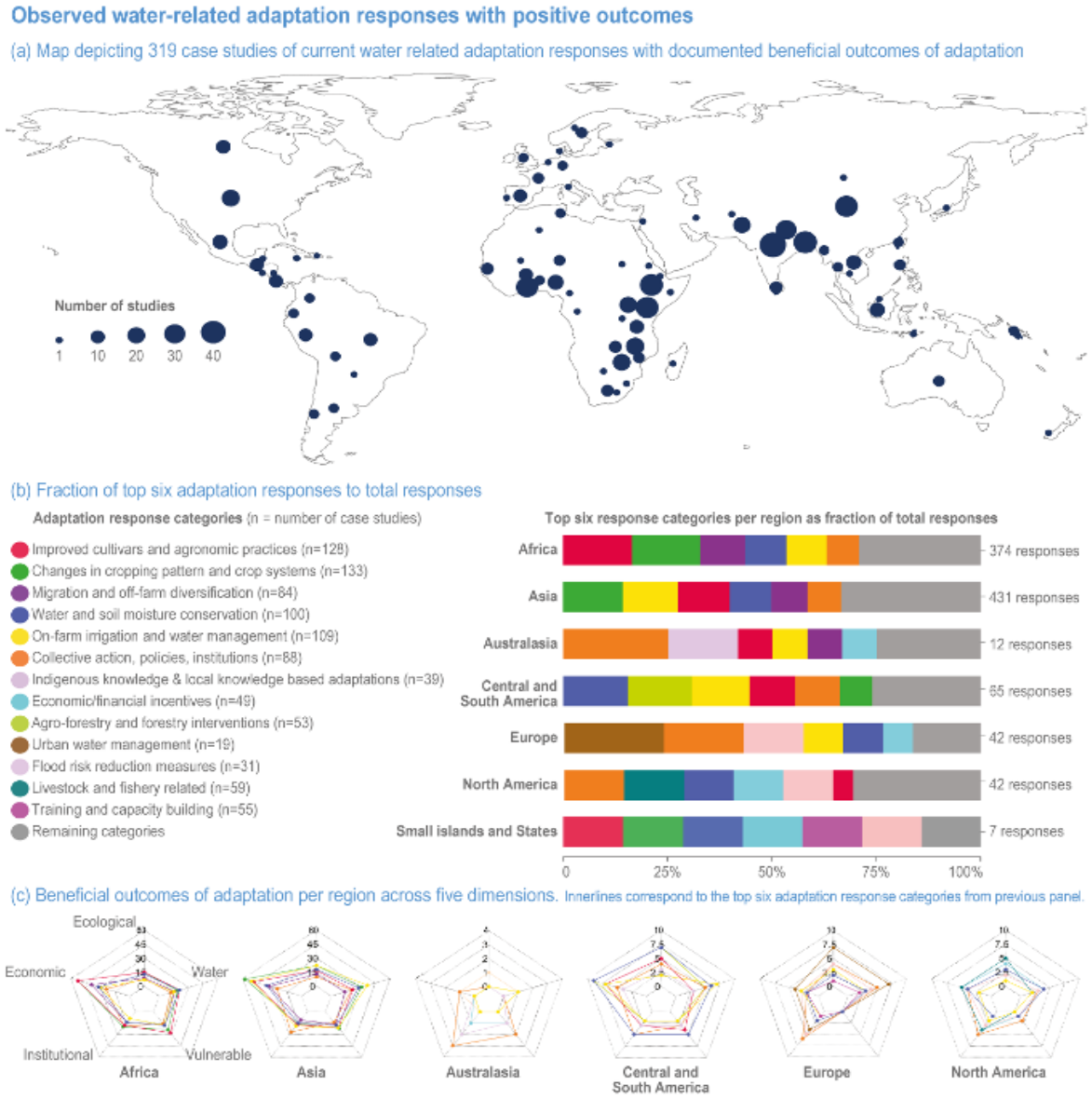
Point 4: Choices and actions now and in the future can lead to shifting development pathways toward sustainability, given the presence of certain enabling conditions.

Point 5: Finding synergy between climate action and SDGs is critical but some trade-offs remain, and knowledge gaps and limited evidence make complete alignment challenging at the moment.

Adaptation has multiple benefits, but methodological challenges remains in linking adaptation to risk reduction

- Adaptation has multiple benefits along various dimensions like economic, ecological, institutional and other outcomes, including for vulnerable groups, which research and implementing agencies should continue to document rigorously;

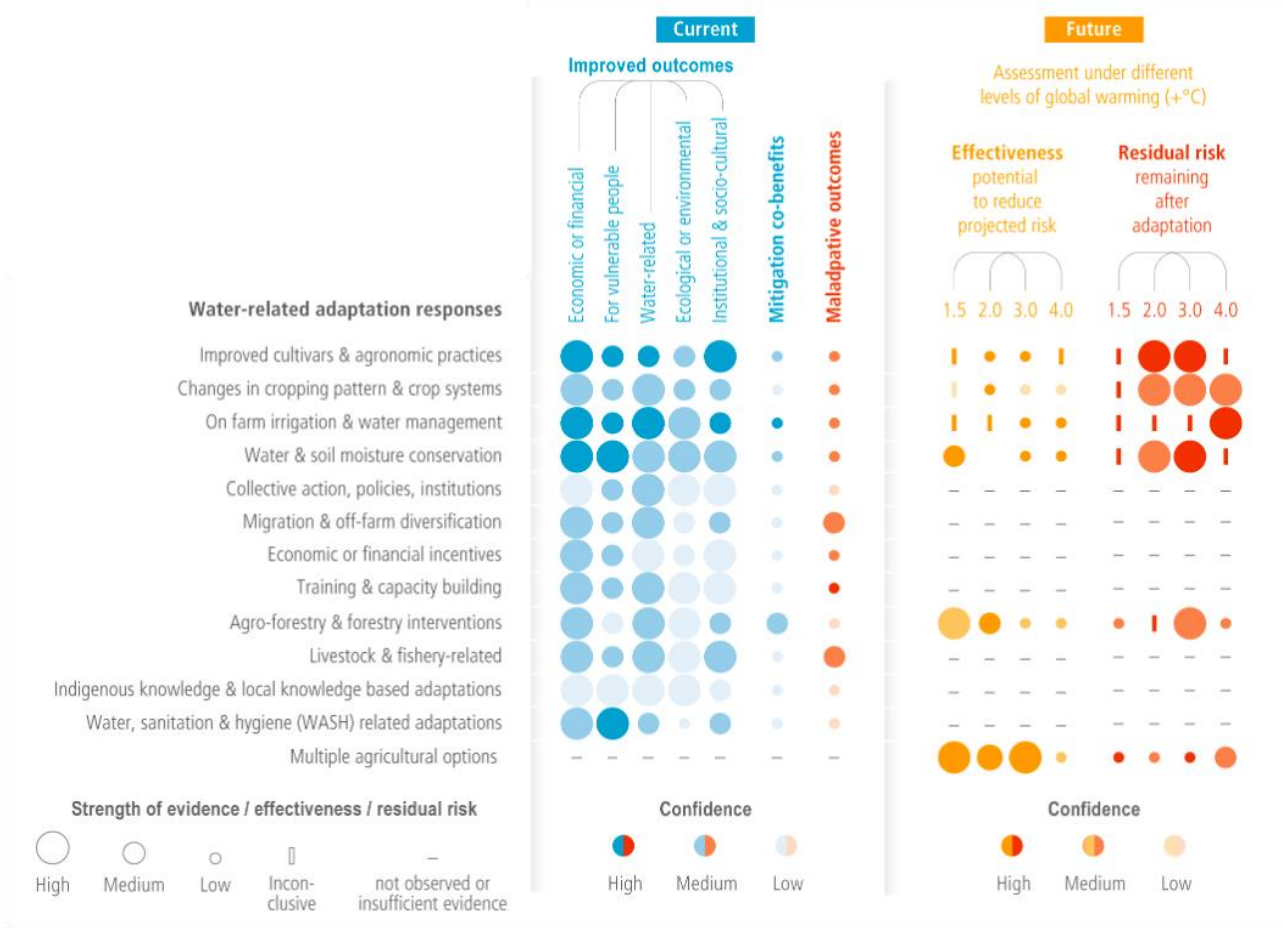
- However, methodological challenges remain in attributing climate risk reduction to adaptation interventions, as literature base for directly linking adaptation to reduction in exposure, vulnerability and hazard is limited.



Source: Figure 4.27, WGII

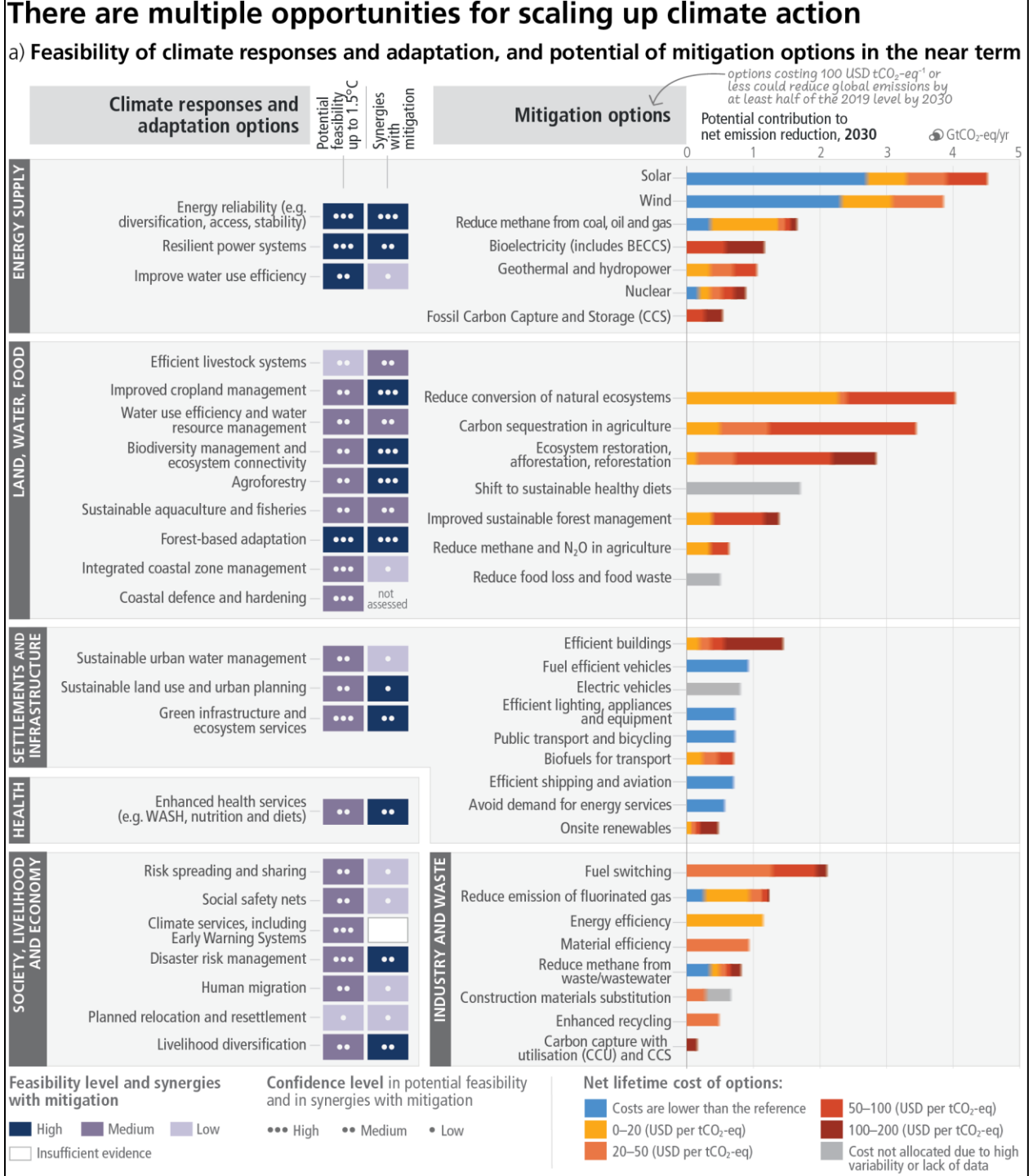
Effectiveness of adaptation in reducing climate risk declines at higher level of warming

- For example, adaptation to water related hazards such as floods and droughts, is most effective up to 1.5°C and effectiveness decreases with increasing warming
- Residual impacts remain, especially at higher levels of warming
- There are hard limits to adaptation in response to global warming levels, e.g. many heat and drought tolerant seed varieties (one of important adaptation for farmers), will not work as effectively in a warmer world.



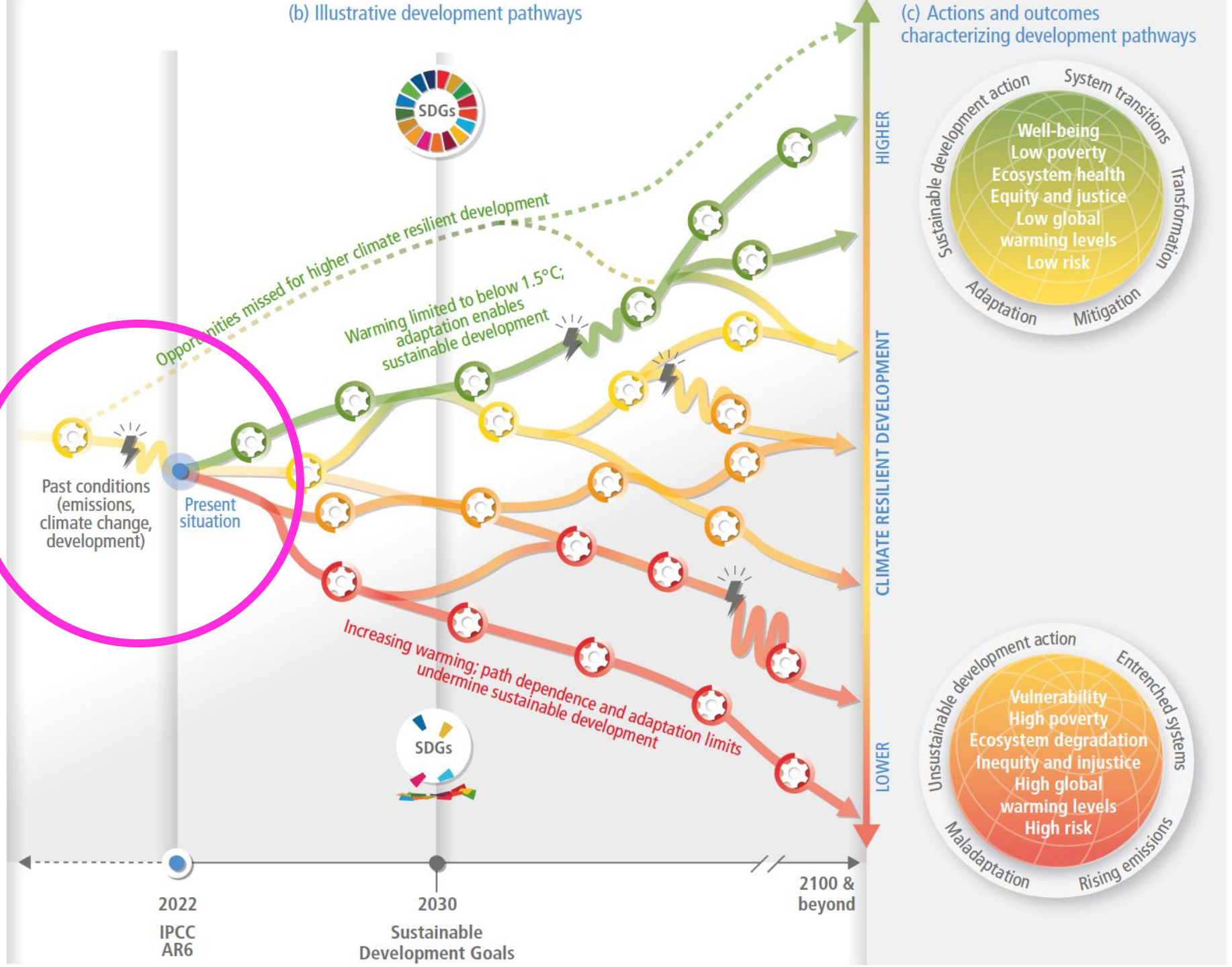
Source: Figure 4.2, WGII; also see Lissner et al. 2024

There are many options for adaptation which also have mitigation co-benefits, but many are not yet cost-effective, for example in land, water and food systems related action, many actions are not yet cost effective – need for more research and investments on cost-effectiveness of measures with adaptation and mitigation co-benefits

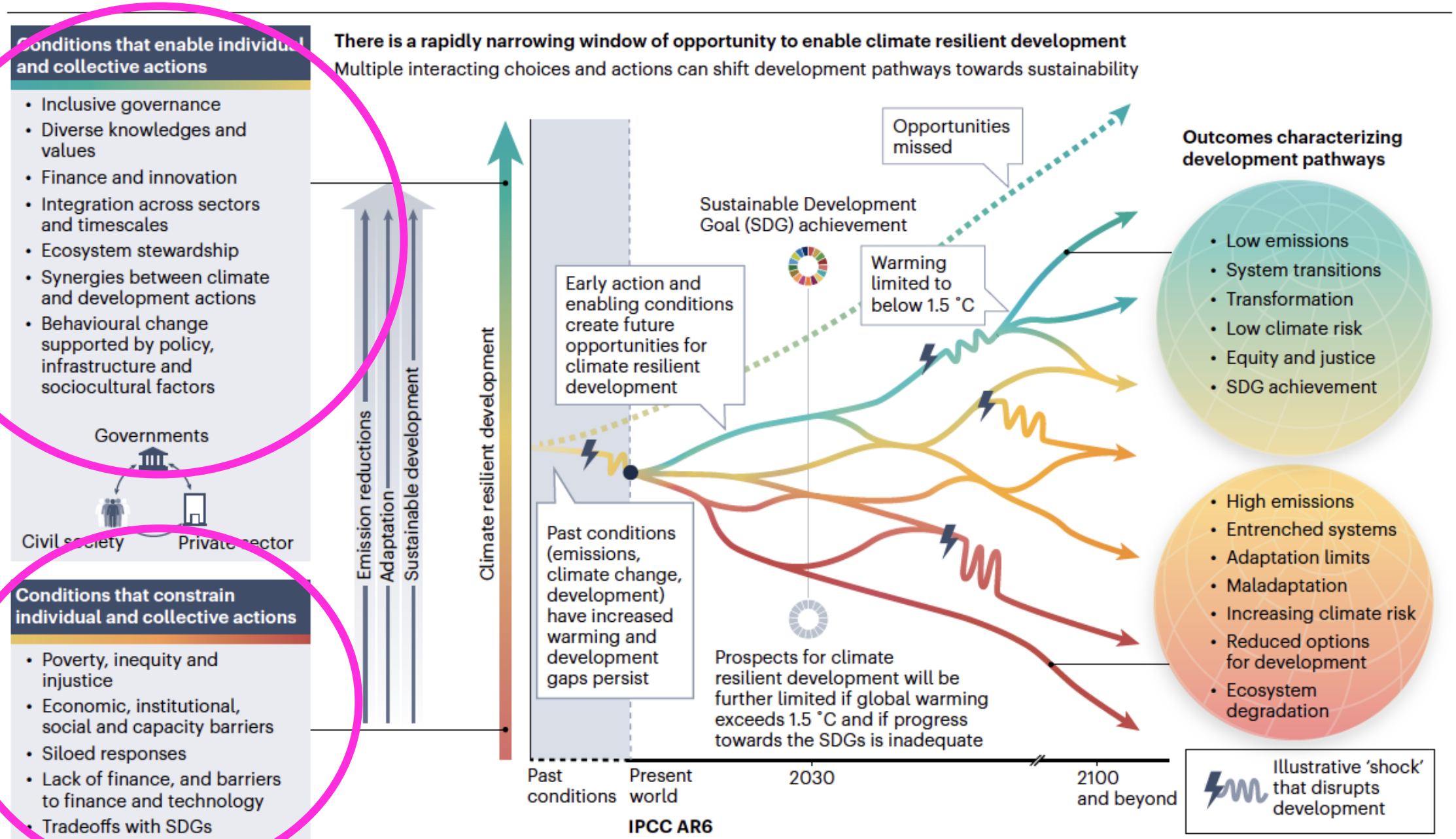


IPCC AR6 SYR SPM Figure 7

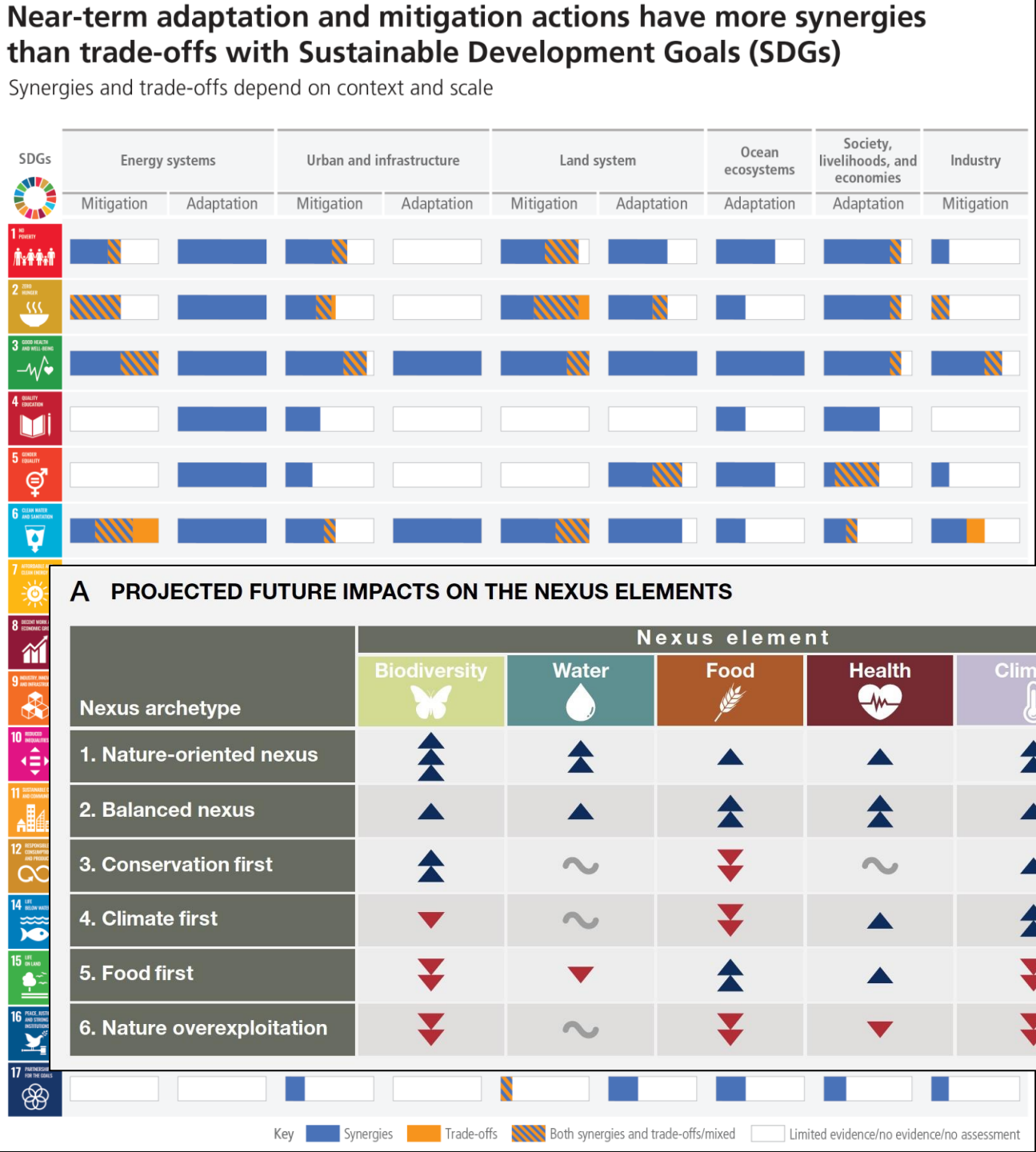
Climate resilient development refers to action on adaptation and mitigation to support sustainable development

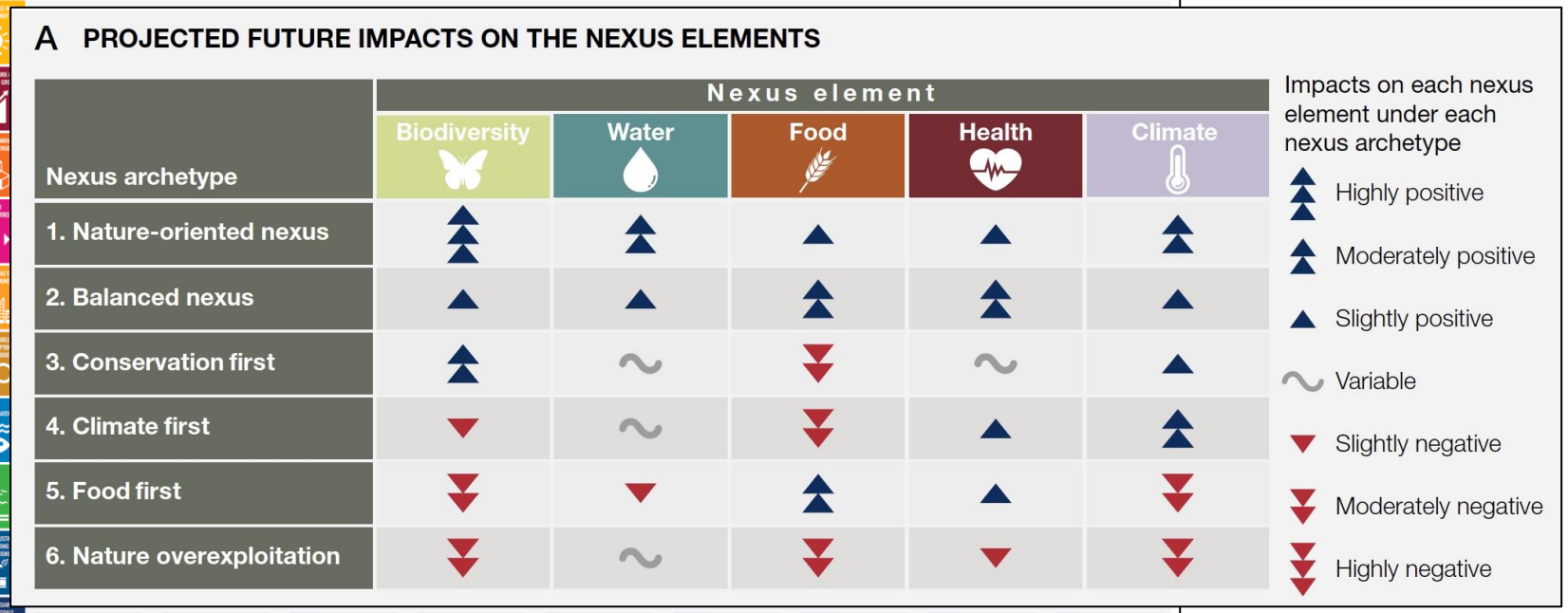


IPCC AR6 WGII SPM Figure 5



Eriksen et al, 2024





IPCC AR6 SYR Figure 4.5

The development context in which climate actions are taken makes a difference.

Reduction of adaptation effectiveness → higher global warming levels; missing SDGs, reversing development gains

IPBES Nexus Assessment SPM.5