

Defining and understanding **transformational adaptation (TA)** at different spatial scales and sectors, and assessing progress in planning and implementing transformational adaptation approaches at the global level (FCCC/TP/2024/8)



Transforming dry, barren and desert areas into fertile lands in China



New wetlands in UK to provide flood protection, biodiversity enhancements and recreational benefits. Photo: WWT Sacha Dench



Green infrastructure – Bosco Vertical skyscraper complex in Milan



Vertical farming, particularly in urban settings and arid environments

Outline



Mandate

Decision 2/CMA.5, paragraph 46



State of play on:

Definition and understanding of transformational adaptation at different spatial scales and sectors
Progress in planning and implementing transformational adaptation at the global level



Building a common understanding on transformational adaptation:

Definition and dimensions of transformational adaptation
Practical attributes of transformational adaptation
Connecting transformational adaptation with specific targets



Possible way forward:

For discussion

Mandate

- The secretariat was requested to undertake the following tasks:
 - Examine **how transformational adaptation is defined and understood** across different spatial scales and sectors, and
 - Explore **how progress in planning and implementing transformational adaptation approaches might be assessed at the global level**, for consideration by the CMA at its sixth session (November 2024)
- A **technical paper** was prepared with the following structure:
 - Chapter I: provides the mandate and the context for subsequent chapters
 - Chapter II: summarize relevant literature, including from reports by IPCC, addressing both points of the mandate
 - Chapter III: outlines potential elements for building a common understanding on transformational adaptation
 - Chapter IV: suggests a possible way forward
 - Annex: contains some examples of case studies and success stories of transformational adaption

Definition of TA

Transformation: A change in ~~the fundamental attributes of natural and human systems~~. Transformation could reflect strengthened, altered, or aligned paradigms, goals, or values towards promoting adaptation for sustainable development, including poverty reduction

- **Deliberate transformations:** A *profound shift towards sustainability*, envisioned and intended by at least some societal actors, *facilitated by* changes in individual and collective values and behaviours, and a fairer balance of political, cultural and institutional power in society
- **Societal (social) transformations:** A change in the *fundamental attributes of human systems* advanced by societal actors

Transformational adaptation: *Adaptation that changes the fundamental attributes of a system* in response to climate and its effects. Such adaptation action:

- Result in significant *changes in structure or function* of the system that go *beyond adjusting existing practices*
- Can be *adopted at a large scale*, can lead to new strategies in a *region or resource system*, transform places and potentially shift locations
- Lead to *deep and long-term societal changes* that influence *sustainable development* (include values, worldviews)

Transformative change: A *system-wide change* that requires more than technological change through consideration of social and economic factors that, with technology, can bring about *rapid change at scale*

Restoration of coastal wetlands for storm protection

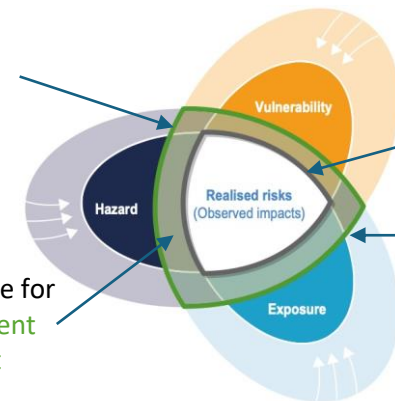
- **Structural change:** large-scale restoration of coastal wetlands, (e.g. salt marshes), to replace or supplement traditional engineered defenses (e.g., seawalls)
- **Functional impact:** wetlands act as natural buffers, absorbing storm surges and reducing flooding. This can improve coastal resilience by enhancing the ecosystem's ability to protect human populations while also providing habitats for biodiversity. It changes the natural coastline structure and **shifts its function from just a natural habitat to also serving as a critical climate adaptation solution.**

Soft limits to adapt?

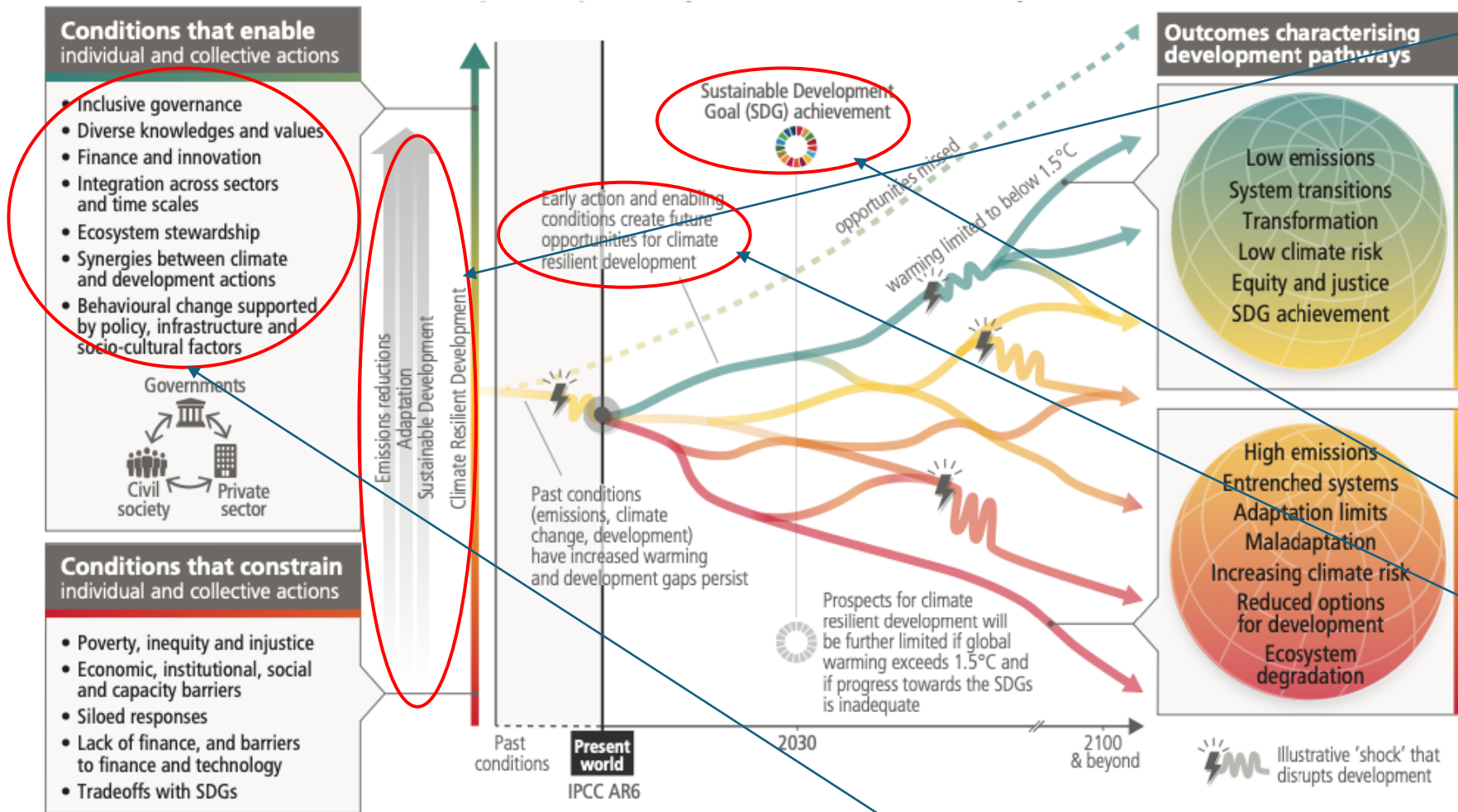
Hard limits to adapt

Solution space for Climate resilient development

TA challenges or overcomes soft limits to adapt?



Understanding TA: Pathways for transformation

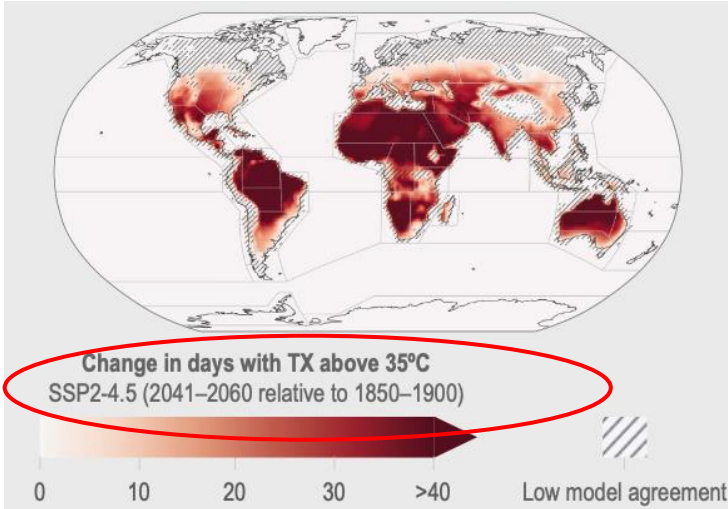


Source: AR6 SPM, figure SPM.6

- Pathways may lead to transformation **deliberately** (consistent with goals) or forced (potentially inconsistent with goals)
- The above-mentioned definitions refer to a profound shift *profound shift towards sustainability... and influenc[e][ing] sustainable development*. **What is specific to TA?**

- Transformational adaptation is one component of climate resilient development (CRD) in which **adaptation**, mitigation and development solutions are pursued together to exploit synergies and reduce trade-offs among these actions
- CRD is both an outcome** at a point in space and time, as observed through SDG achievement indicators, **but also a process** consisting of actions and social choices made by multiple actors—government, industry, media, civil society, and science

Understanding TA: From incremental to transformational planned adaptation for managing climate related heat risk to health (global and regional)



Risk to human health from heat (RKR-E)

- Observed impacts
- Projected risks
- Incremental adaptation complemented by transformational adaptation
- Transformational adaptation
- Soft limit (to incremental adaptation)
- Hard limit
- WG I Detection and attribution statement

Confidence

(•)	(••)	(•••)	(••••)	(•••••)
Low	Medium	High	Very high	Virtually certain

Source: AR6 WGII, figure 17.6

Global

Heat is a significant health risk due to widespread urbanization, demographic changes and increase in hot weather (•••) 323,000 estimated heat-related deaths and 13 million heat-related DALYs in 2019.

Temperature-related mortality expected to increase under medium and high heating scenarios even with adaptation. By 2050 (compared to 1961–1991) an excess of 94,000 deaths per year attributable to climate change projected due to heat for medium warming.

Implementation of heat warning systems has reduced relative mortality risk in developed countries (•••), unclear trends in low-middle income countries. Multi-sectoral integrated approach beneficial including heat early warning and response systems targeting vulnerable groups (•••).

Longer term urban planning and design, including Nature based solutions (NBS) to reduce urban heat island effects. Improved basic protection for outdoor work including work rescheduling to cooler times of the day (•••).

Some regions with heat stress conditions approaching upper limits of labour productivity (•••).

Thresholds of survivability approached (•••).

Hot extremes (including heatwaves) have become more frequent and more intense across most land regions since the 1950s (•••••).

Human-induced climate change is the main driver of these changes (•••).

Every additional 0.5°C of global warming causes clearly discernible increases in the intensity and frequency of heatwaves (•••).

Africa

Climate variability impacting the health of tens of millions of Africans through exposure to extreme heat. Heat extremes (hot days and hot nights) increased in frequency since 1980 (•••).

Increasing temperatures will cause tens of thousands of additional deaths under moderate and high global warming scenarios, particularly in North, West and Central Africa (•••).

Cooling stations, limited evidence of pro-active climate change adaptation in African cities (•••).

Urgent need for improved societal and political transformations to reduce climate change risks for vulnerable groups (••).

Deployment considered necessary of NBS with demonstrated health, ecological, economic and social co-benefits.

Morbidity and mortality will escalate with further global warming, placing additional strain on health and economic systems (•••).

Under high warming scenarios annual exceedance of deadly heat thresholds in North, West and Central Africa (•••).

Examples of transformational adaptation

- **Promoting decentralized rainwater harvesting in cities to combat water scarcity** (structural change, functional impact, governance and management)
- **Adopting regenerative agriculture for climate-resilient food production**
- **Building climate-resilient health systems through green urban design**
- **Assisting migration of species to new habitats**
- **Restoring coastal wetlands for storm protection**
- **Relocating a coastal community**
- **Promoting land-tenure reform to address climate vulnerability and inequality**
- **Reintroducing cultural fire practices to manage wildfire risk**

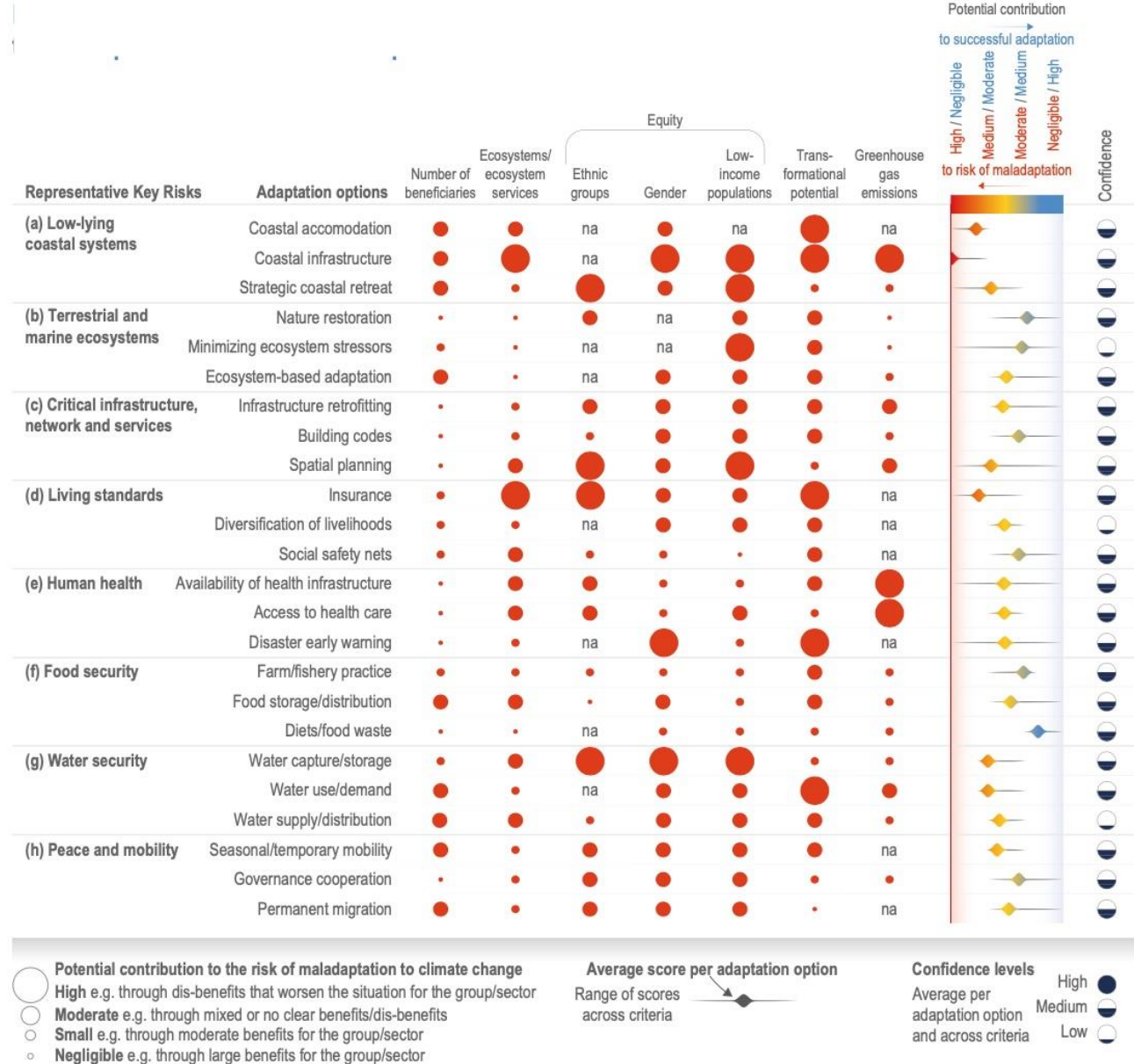
Understanding TA: Dimensions of change

Operational descriptors used for low, medium and high TA

Several conceptual frameworks were used to describe the **multi-dimensional nature of transformational adaptation**:

1. Evaluate evidence of transformational adaptation	2. Assess the potential of transformational adaptation	3. Implement transformational adaptation
Depth of [deliberate] change (the degree to which adaptations reflect major shifts and have been implemented widely)	Non-risk-focused actions that brought positive outcomes as a systems change	Systemic change (lead to fundamental shifts in system structure and functions)
Scope/scale of [deliberate] change (geographic or institutional)	<i>Result in significant changes in structure or function of the system that go beyond adjusting existing practices</i>	Scale (contextually large change processes and impacts [of change])
Speed of [deliberate] change		Speed of change (accelerate impacts [of change] to achieve appropriate speed of change)
Limits of change (evidence that adaptation limits are being challenged or overcome)	Risk-focused actions are (mostly) not feasible anymore	<i>Lead to deep and long-term? societal changes that influence sustainable development</i>
<i>... can bring about rapid change at scale.</i>	<i>Can be adopted at a large scale, can lead to new strategies in a region or resource system, ...</i>	Adaptive sustainability (robustness, resilience and adaptiveness of change)
		Relevance (alignment with goals and context through time)

Understanding TA: Potential contribution of 24 adaptation-related options to maladaptation and successful adaptation

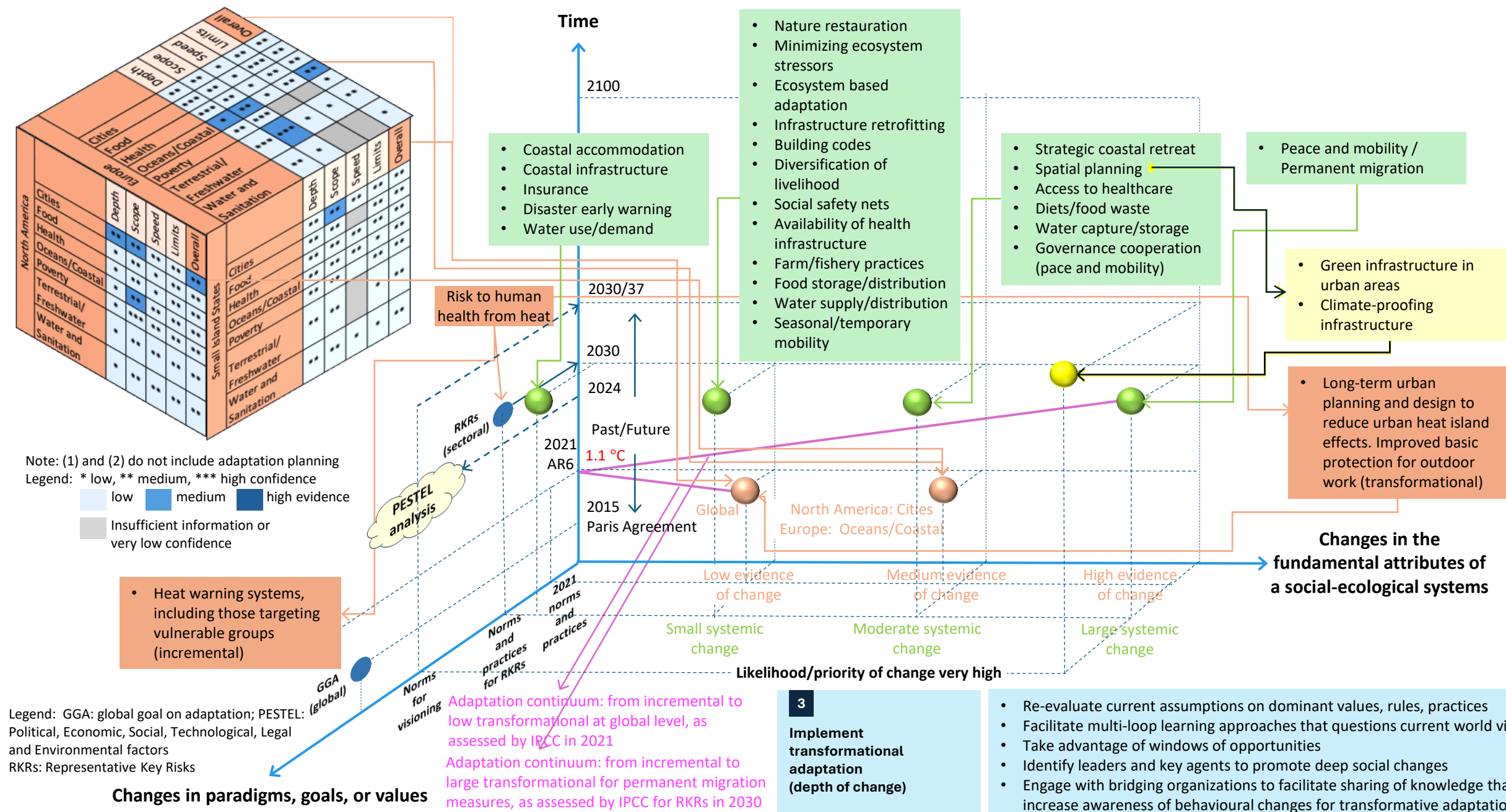


- Although **transformational adaptation** could be seen as a “better adaptation” (alignment with goals, positive outcome), it **can**, in some cases, **result in maladaptation**
- Transformational adaptation does not imply adequacy or effectiveness of adaptation** (e.g., low transformation may be sufficient for some climate risks, and high transformation may be insufficient to offset others)

Source: AR6 SPM, figure 17.11

1 Evaluate evidence of transformational adaptation

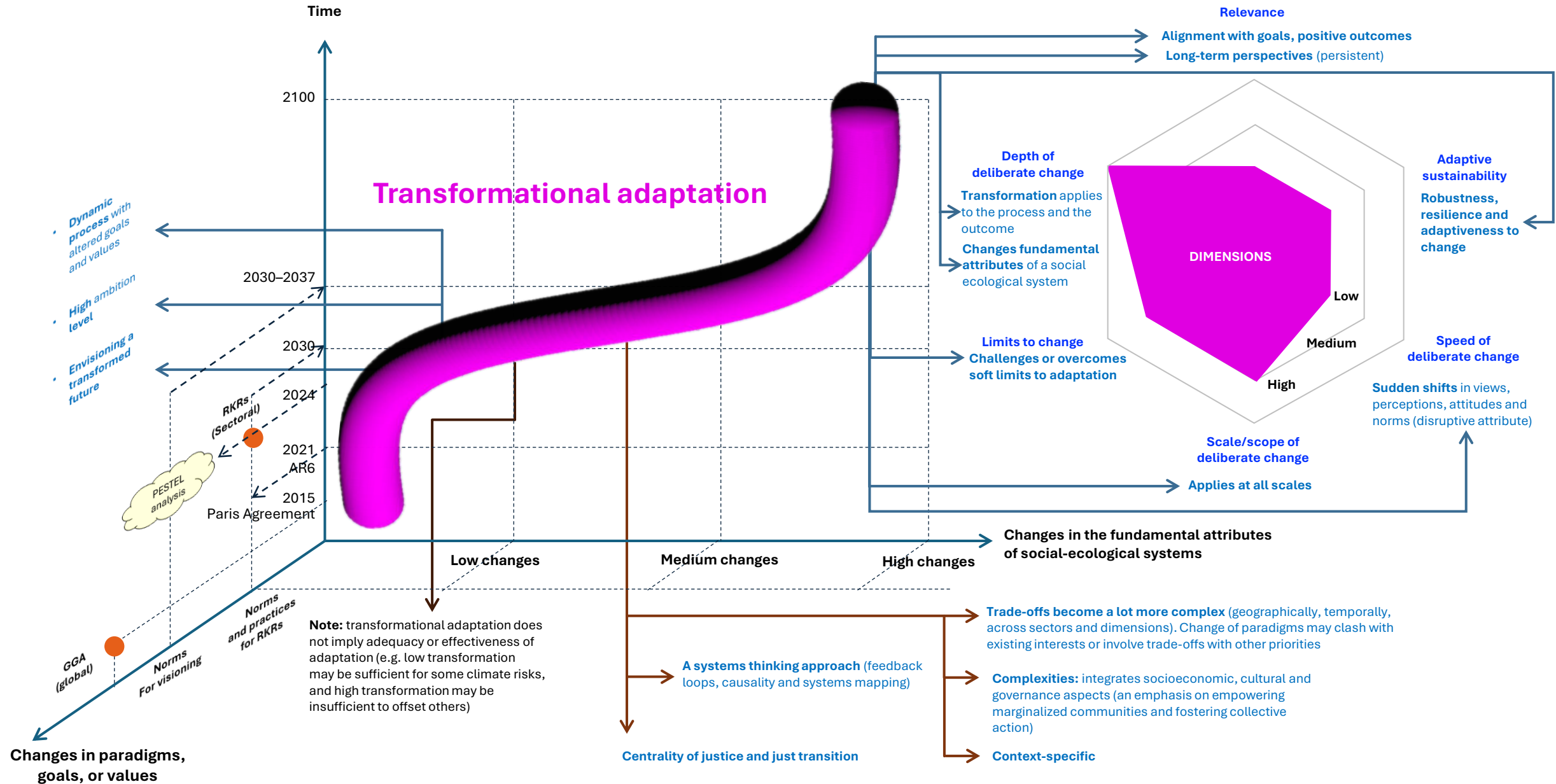
2 Assess the potential of transformational adaptation



Building a common understanding on TA: Definition and dimensions

- A common understanding of transformational adaptation **need not entail a prescriptive definition beyond what is outlined by the IPCC**
 - TA can be defined based on experiences and contexts, or by process or outcomes/impacts [on risks]
 - Flexibility allows different communities to share the concept while maintaining unique interpretations, all within the the framework provided by IPCC
 - Flexibility also accommodates evolving baseline and facilitates visioning exercises helping adjust goals and targets at all levels
- A **common understanding of the dimensions of transformational adaptation reduces conceptual ambiguity**. Such dimensions:
 - Should **be specific to transformational adaption**. Depth and limits are core dimensions. Some dimensions may apply to a particular stage in the adaptation cycle (e.g., planning, implementation, monitoring, evaluation and learning)
 - **Are strongly interconnected** (e.g., dynamic interplay between depth of change, speed and scope/scaling)
 - Should **provide clarity with potential overlaps** with concepts like loss and damage and climate resilient development
- The paper propose the following key dimensions:
Depth of [deliberate] change, **limits** of change, **scope/scale** of [deliberate] change, **speed** of change and **[adaptive] sustainability** as fundamental dimensions of TA and **robustness** being a dimension specific to TA implementation/monitoring, evaluation and learning

Building a common understanding on TA: Some practical attributes



Building a common understanding on TA: Connecting it to specific targets

- **Linking transformational adaptation with specific targets** can support countries and relevant agencies in implementing on the ground adaptation efforts and help to embed transformational thinking in the next generation of NAPs
- **Indicators for transformational adaptation** should reflect progress both in terms of the process and its outcome. Such indicators could, for example:
 - Evaluate the depth, scope, speed and limits of adaptation actions to effectively measure their transformational potential (e.g. low, medium, high);
 - Measure the extent to which diverse stakeholder groups, including marginalized populations, are involved in the decision-making process and assess the role of Indigenous knowledge in transformational adaptation
 - Explore the need for capacity-building for transformational adaptation and the type of learning required, from first-order ('business as usual') to second-order (transformational);
 - Track actions for creating enabling environments for transformational adaptation, such as policies revised or introduced to support transformational adaptation, the level of inter-agency coordination and the establishment of robust monitoring and evaluation systems;
 - Analyze how change is envisioned within or across systems
 - Identify how equity and distributional concerns are addressed in decisions, alongside visioning for future transformations
- **Approaches for estimating dimensions of transformational adaptation**
 - Some dimensions of transformative adaptation can be estimated **using both inductive and deductive approaches**, aligning interview responses with indicators from published studies
 - Depending on the specific context and goals of the assessment **a hierarchy or weighting of dimensions** associated with different indicators of transformation could be used

Possible way forward:

- Much work remains to be done to improve understanding of TA, including on:
 - Systematically documenting and sharing ongoing efforts, success stories and experience
 - Conducting ‘horizon scanning’ exercises at the regional level
 - Identifying transformational adaptation approaches for each target under the UAE Framework for Global Climate Resilience and for different sectors and regions
 - Using the work on indicators under the UAE–Belém work programme as an opportunity to formulate meaningful indicators specific to TA
- Possible next steps include:
 - Encouraging collaborative efforts and more collective thinking on TA
 - Advancing research on TA (e.g. on technology and innovation in TA)
 - Utilizing IPCC findings on TA, in particular on evidence and potential, to guide priority areas and future work. Adaptation-related reports submitted by Parties could complement these findings
 - Harmonizing how the concept of transformation is understood and applied across adaptation and mitigation efforts, including reporting requirements

Thank you!



@unfcccclimatevoices4resilience



@climatevoices4resilience



YouTube @UNFCCCClimateVoices4Resilience



<https://www.linkedin.com/groups/13985893/>