

27. April 2022

Entscheidungspfade

Reinhard Mechler, IIASA

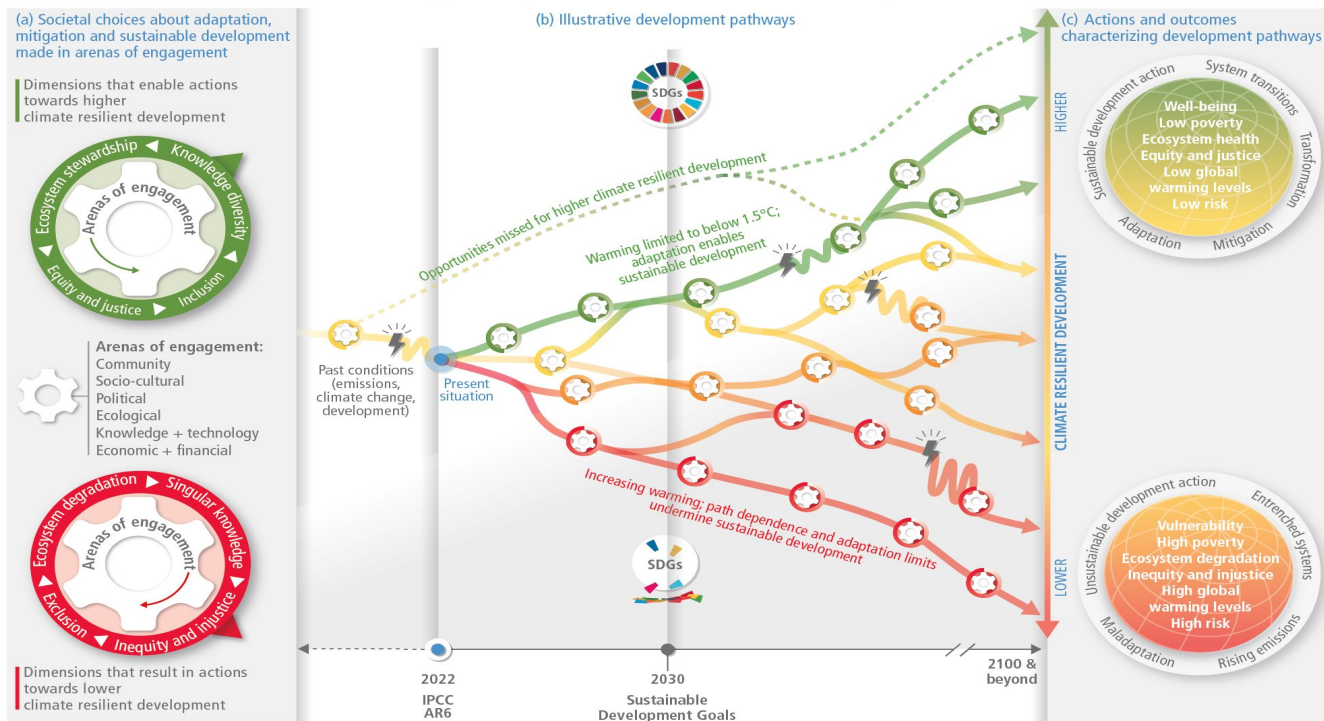
Leitautor Kapitel 17: Decision-making options for managing risks

Beitragender Autor: Summary for Policymakers



Klimaresiliente Entwicklungspfade im Kontext multipler Krisen (Climate Resilience Development Pathways-CRD)

There is a rapidly narrowing window of opportunity to enable climate resilient development



Illustrative climatic or non-climatic shock, e.g. COVID-19, drought or floods, that disrupts the development pathway

Narrowing window of opportunity for higher CRD

Abb. SPM.5

Illustrative climatic or non-climatic shock, e.g. COVID-19, drought or floods, that disrupts the development pathway

Narrowing window of opportunity for higher CRD

Globale Klimarisiken



Hitzestress



Wasserknappheit



**Ernährungs-sicherh
eit**



Überflutungen

- Risiken am höchsten, wo Arten und Menschen in Nähe thermischer Grenzen leben, entlang von Küsten, in enger Verbindung zur Kryosphäre oder Flüssen
- 50% der Weltbevölkerung sieht sich jedes Jahr schwerer Wasserknappheit ausgesetzt
- Mehr als 3 Milliarden Menschen sehr vulnerabel: West-, Zentral- und Ostafrika, Südasien, Zentral- und Südamerika, SIDS, und Arktis
- Klimafolgen zunehmend menschengemachtem Klimawandel zugeschrieben

Klimarisikomanagement/Anpassung

- Faktencheck

- Signifikante Anpassungsfortschritte: in mindestens 170 Ländern Anpassung in Klimapolitik aufgenommen und viele Städte integrieren Klimawandel in Planungsprozesse
- Anpassung reduziert Risiken und erzeugt Zusatznutzen
- Anpassungslücken vergrößern sich jedoch in vielen Regionen - finanzielle, institutionelle, technische, institutionelle Faktoren
- Anpassungsgrenzen – einige natürliche und menschliche Systeme befinden sich schon nahe ihrer Anpassungsgrenzen und zusätzliche entstehen mit zunehmender globaler Erwärmung

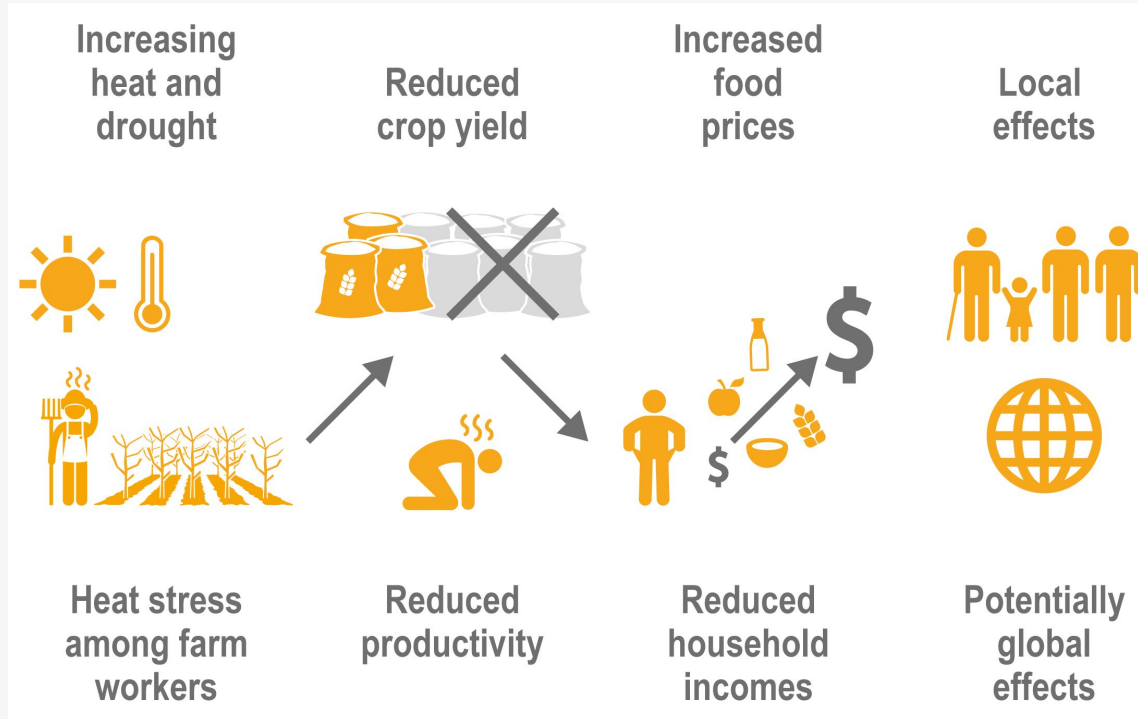


Bei weiterer globaler Erwärmung nehmen Risiken zu und Anpassungsgrenzen werden erreicht

- Anpassungsgrenzen
 - **Hart:** Korallenriffe, Küstenfeuchtgebiete, einige Regenwälder, einige Gletscher und Gebirgsökosysteme
 - **Weich:** küstennahe Siedlungen, Subsistenzlandwirtschaft
- Wenn globale Erwärmung in naher Zukunft 1,5 °C überschreitet, bedeutet unvermeidbare Zunahme mehrerer Klimagefahren verstärkte Risiken für Ökosysteme und Menschen –über Jahrhunderte
- 1 Milliarde Menschen Risiken von Meeresspiegelanstieg ausgesetzt bis 2050
- 16-facher Anstieg von Risiken von Hitzewellen bei 2.5°C Erwärmung



Interagierende und multiple Risiken



Systemische Perspektive

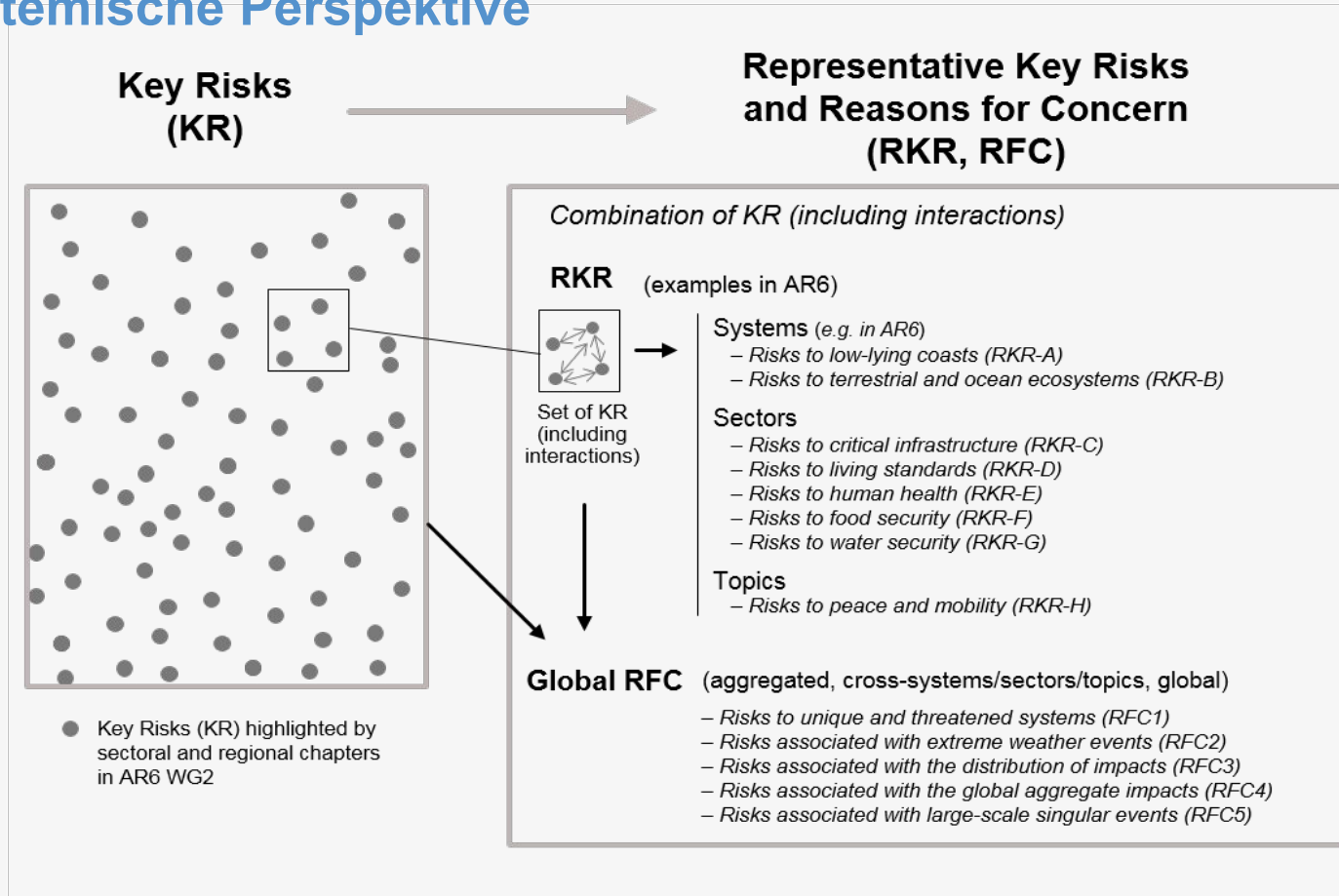
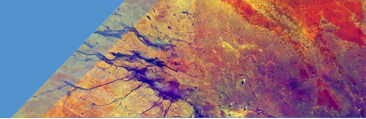


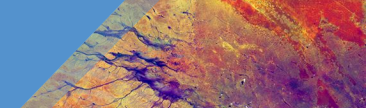
Abb. 16.13



Anpassung und Risikomanagement: Systemische Perspektive

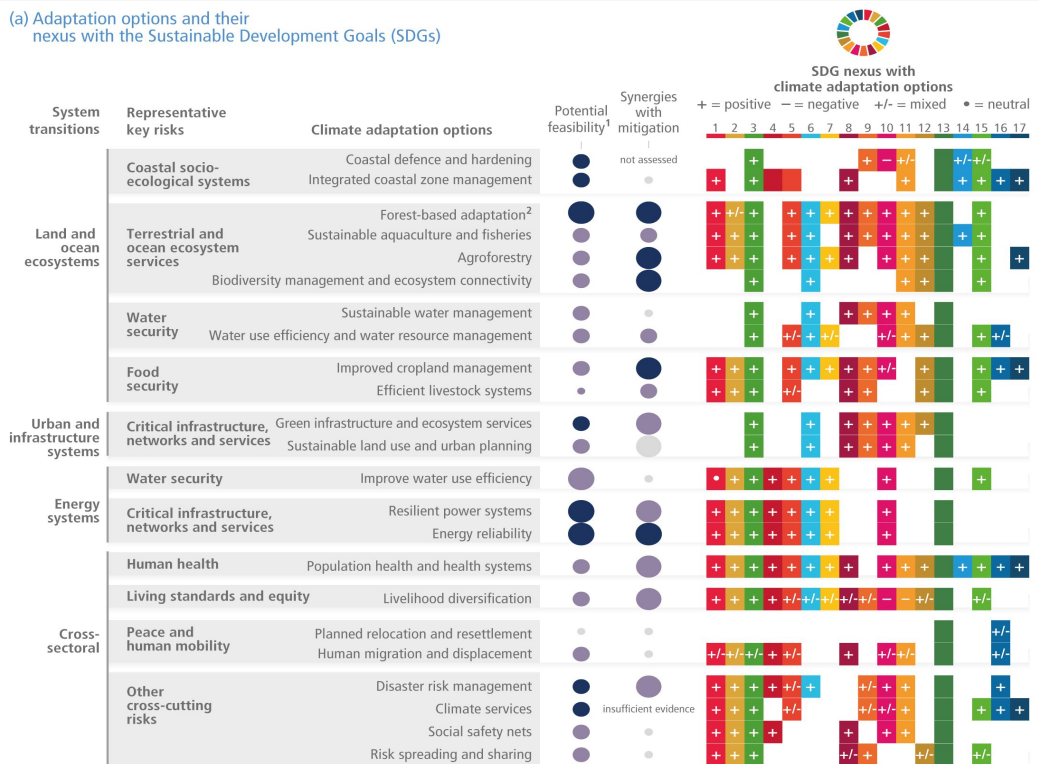
System transitions	Representative key risks	Climate adaptation options
	Coastal socio-ecological systems	Coastal defence and hardening Integrated coastal zone management
Land and ocean ecosystems	Terrestrial and ocean ecosystem services	Forest-based adaptation ² Sustainable aquaculture and fisheries Agroforestry Biodiversity management and ecosystem connectivity
	Water security	Sustainable water management Water use efficiency and water resource management
	Food security	Improved cropland management Efficient livestock systems
Urban and infrastructure systems	Critical infrastructure, networks and services	Green infrastructure and ecosystem services Sustainable land use and urban planning
	Water security	Improve water use efficiency
Energy systems	Critical infrastructure, networks and services	Resilient power systems Energy reliability
	Human health	Population health and health systems
	Living standards and equity	Livelihood diversification
Cross-sectoral	Peace and human mobility	Planned relocation and resettlement Human migration and displacement
	Other cross-cutting risks	Disaster risk management Climate services Social safety nets Risk spreading and sharing

Abb. SPM 4a



Anpassung und Risikomanagement: Systemische Perspektive

(a) Adaptation options and their nexus with the Sustainable Development Goals (SDGs)



¹ Feasibility assessment relevant in the near term and up to 1.5°C global warming

² Including sustainable forest management, forest conservation and restoration, reforestation and afforestation.

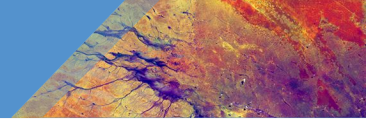
Assessment scores
 ○ Low ○ Medium ○ High

Confidence levels
 ● Low ● Medium ● High

- 1: No Poverty
- 2: Zero Hunger
- 3: Good Health and Well-being
- 4: Quality Education
- 5: Gender Equality
- 6: Clean Water and Sanitation
- 7: Affordable and Clean Energy
- 8: Decent Work and Economic Growth
- 9: Industry, Innovation and Infrastructure

- 10: Reducing Inequality
- 11: Sustainable Cities and Communities
- 12: Responsible Consumption and Production
- 13: Climate Action
- 14: Life Below Water
- 15: Life On Land
- 16: Peace, Justice, and Strong Institutions
- 17: Partnerships for the Goals

Abb. SPM 4a



Anpassung und Risikomanagement: Systemische Perspektive

(b) Multidimensional feasibility, benefits and disbenefits of adaptation options

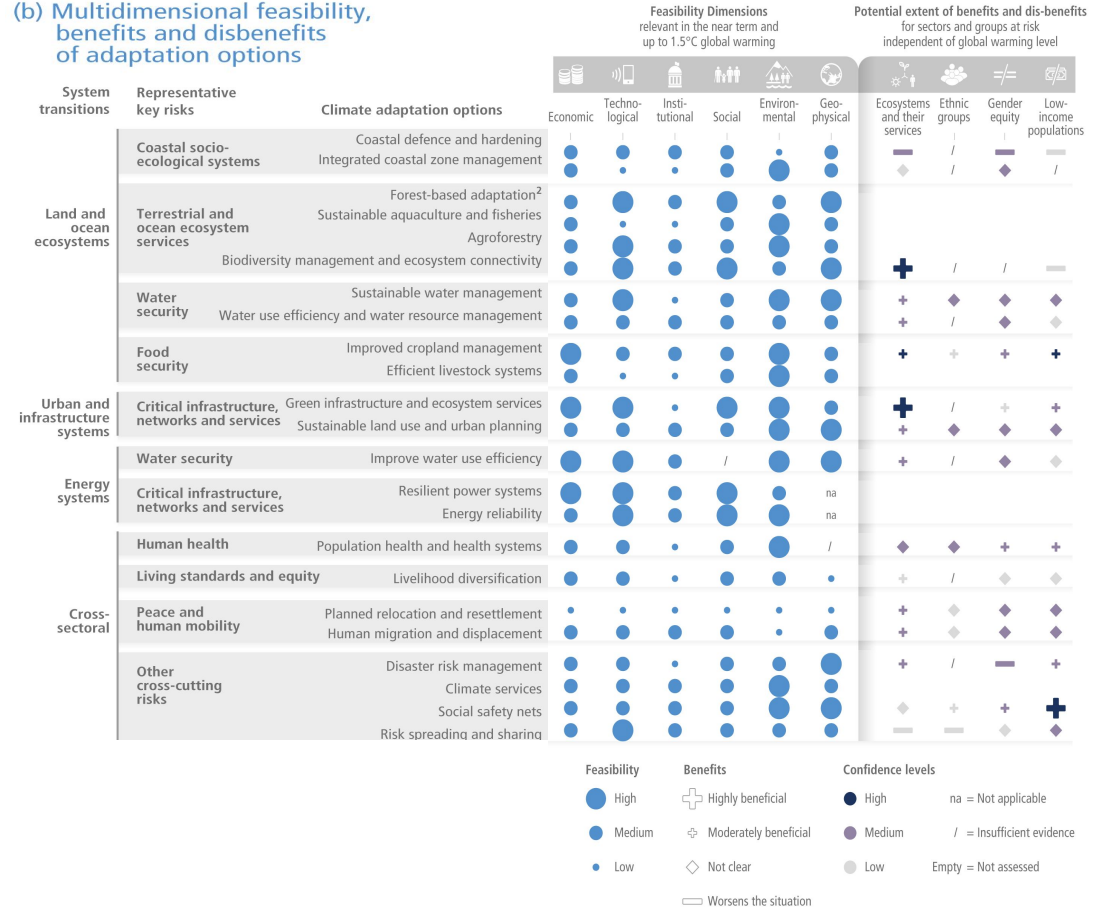


Abb. SPM 4b



Wassersicherheit

Optionen Betriebsebene

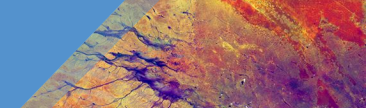
- Bewässerung
- Regenwassernutzung, Wassermanagement
- Konservierung von Bodenfeuchtigkeit

*Sozio-ökonomische, und ökologische Nutzen;
Vulnerabilität reduziert*

Systemische Optionen

- Trinkwasserspeicher
- Management von Überflutungen und Dürren
- Landnutzungsplanung

Aber: Effektivität reduziert bei weiterer Erwärmung



(a) Adaptation options and their nexus with the Sustainable Development Goals (SDGs)



SDG nexus with climate adaptation options

+ = positive - = negative +/- = mixed • = neutral

Representative key risks

Climate adaptation options

Potential feasibility¹

Synergies with mitigation

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

Water security

Sustainable water management
Water use efficiency and water resource management



(b) Multidimensional feasibility, benefits and disbenefits of adaptation options

Feasibility Dimensions relevant in the near term and up to 1.5°C global warming

Potential extent of benefits and dis-benefits for sectors and groups at risk independent of global warming level

Climate adaptation options

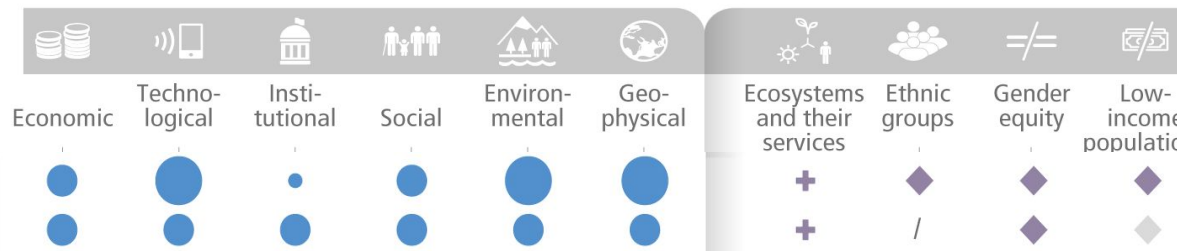
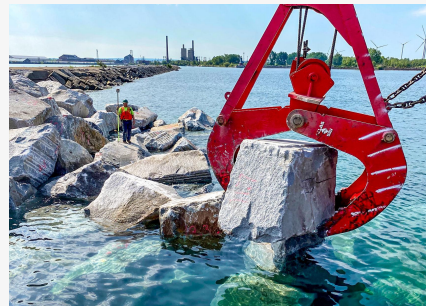
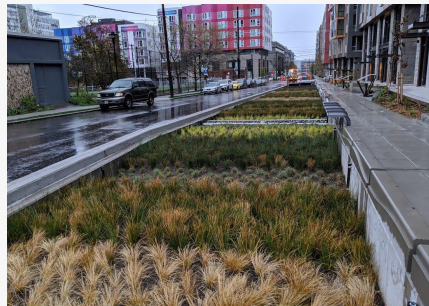


Abb. SPM 4 a,b



Urbane Transformation

2050 leben 2/3 der Weltbevölkerung in urbanen Räumen

Effektive Maßnahmen

- ‘Nature-based’ + ingenieurstechnisch
- ‘Grüne’ und ‘blaue’ Anpassungszonen
- Soziale Sicherungssysteme für Katastrophen und Shocks
- Urbane Landwirtschaft

Systemische Nutzen

- Positive Gesundheitseffekte
- Ökosystem-Nutzen

Systemtransitionen

Change along resilience pathways

From incremental....

...to transformational

- Innovation
- Governance
- Equity
- Diversification
- Exchange
- Learning



Intensity of change

Hitze-Stress: Systemtransitionen

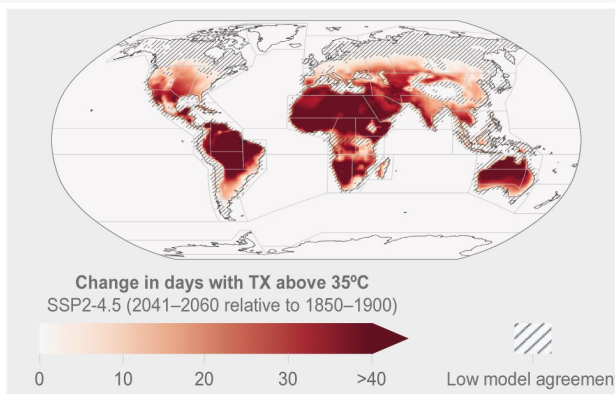
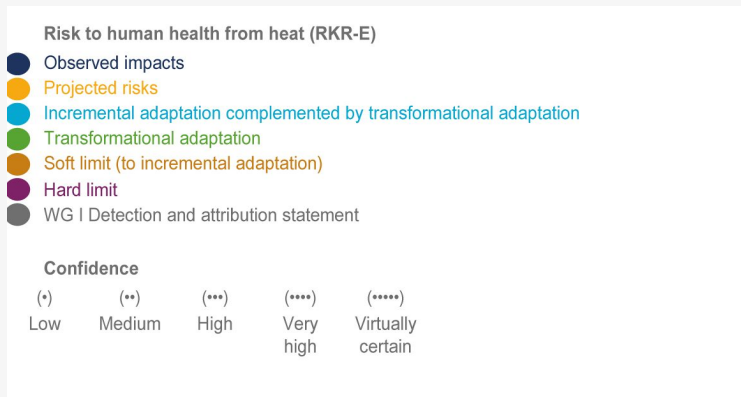


Abb. 17.5

Europe

70,000 and 54,000 deaths during 2003 and 2010 heatwaves, adaptation actions have reduced heat-related mortality in parts of Southern Europe (**).

Risk of heat mortality and morbidity to more than triple at 3°C compared to 1.5°C with projected 90,000 deaths in 2100 (**).

Air cooling, heat warning and response systems, building interventions, but largely incremental adaptation (**).

Increasing use and plans for NBS in urban spaces; large scale system transformations needed due to adaptation limits in Southern Europe (**) involving strong behavioural change combined with large portfolios of preventive and planning options.

Above 3°C limits to the adaptation potential of people and existing health systems, particularly in Southern and Eastern Europe and with health systems under pressure (**).

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 (**).

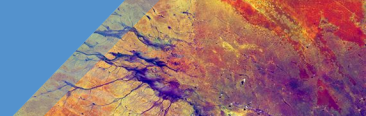
Increasing temperatures will cause tens of thousands of additional deaths under moderate and high global warming scenarios, particularly in North, West and Central Africa (**).

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 (**).



Hitze-Stress: Systemtransitionen

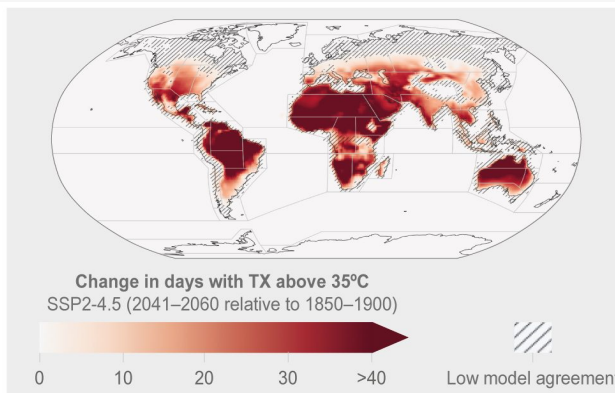
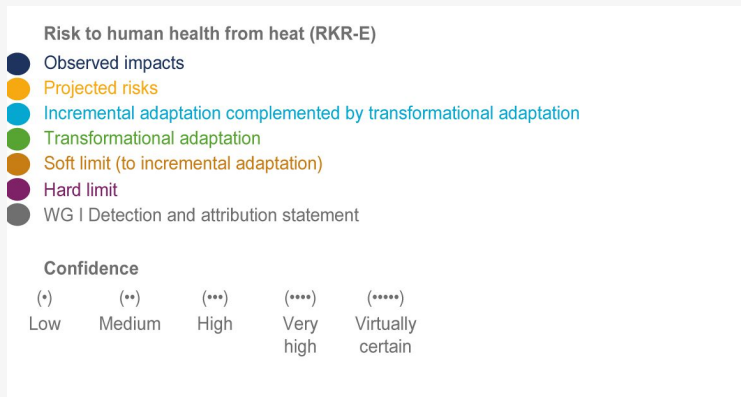


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Hotspots im globalen Süden Bis zu 3.6 Milliarden Menschen hoch vulnerabel

Überlappende und systemische Herausforderungen

- Limitierter Zugang zu Wasserressourcen, sanitäre Dienste und Gesundheit
- Klimasensitive Lebensgrundlagen
- Hohe Prävalenz von Armut
- Limitierte finanzielle Ressourcen
- Governance Defizite

Finanzieller Rahmen

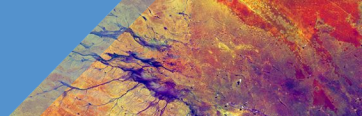
- Globale finanzielle Mittel für Anpassung (und Vermeidung) unzureichend: Adaptation gap
- Eigenfinanzierung und soziale Sicherungssysteme im globalen Süden oft limitiert, Versicherungsdichte gering
- Vermeidung stärker im Fokus
- Klimafolgen und –risiken bremsen sozio-ökonomische Entwicklung



Dringlichkeit: Risiken und Chancen

- **Klimaschutz** forcieren: Erwärmung $> 1,5^\circ\text{C}$ mit existentiellen und irreversiblen Auswirkungen
- **Klimaresiliente Entwicklung implementieren**
 - Systemische Perspektive: multiple Resilienz-Dividenden
 - Urbanisierungstrends und Transformationen nutzen
 - Ökosysteme stabilisieren und Biodiversität schützen
- **Klimaanpassung/Klimarisikomanagement:** nationale und internationale Anpassungslücken schließen, int'l Klimafinanzierung
- Umgang mit Residualrisiken (**Loss and Damage**): Soziale Sicherungssysteme und Risiko-Fonds im





BESTEN DANK

Reinhard Mechler

IIASA

mechler@iiasa.ac.at

[@reinhardmechler](#)

For More Information:

 www.ipcc.ch

 IPCC Secretariat: ipcc-sec@wmo.int

IPCC Press Office: ipcc-media@wmo.int

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Ernährungssicherheit

Effektive Optionen:

- Cultivar improvements
- Agroforestry
- Farm and landscape diversification
- Community-based adaptation
- Strengthening biodiversity

Wider benefits:

- Food security and nutrition
- Health and well-being
- Livelihoods

