

09.03.2022

Decision-making Options for Managing Risks

Dr. Diana Reckien, Coordinating Lead Author WGII Chapter 17
Associate Professor Climate Change and Urban Inequality,
University of Twente, the Netherlands

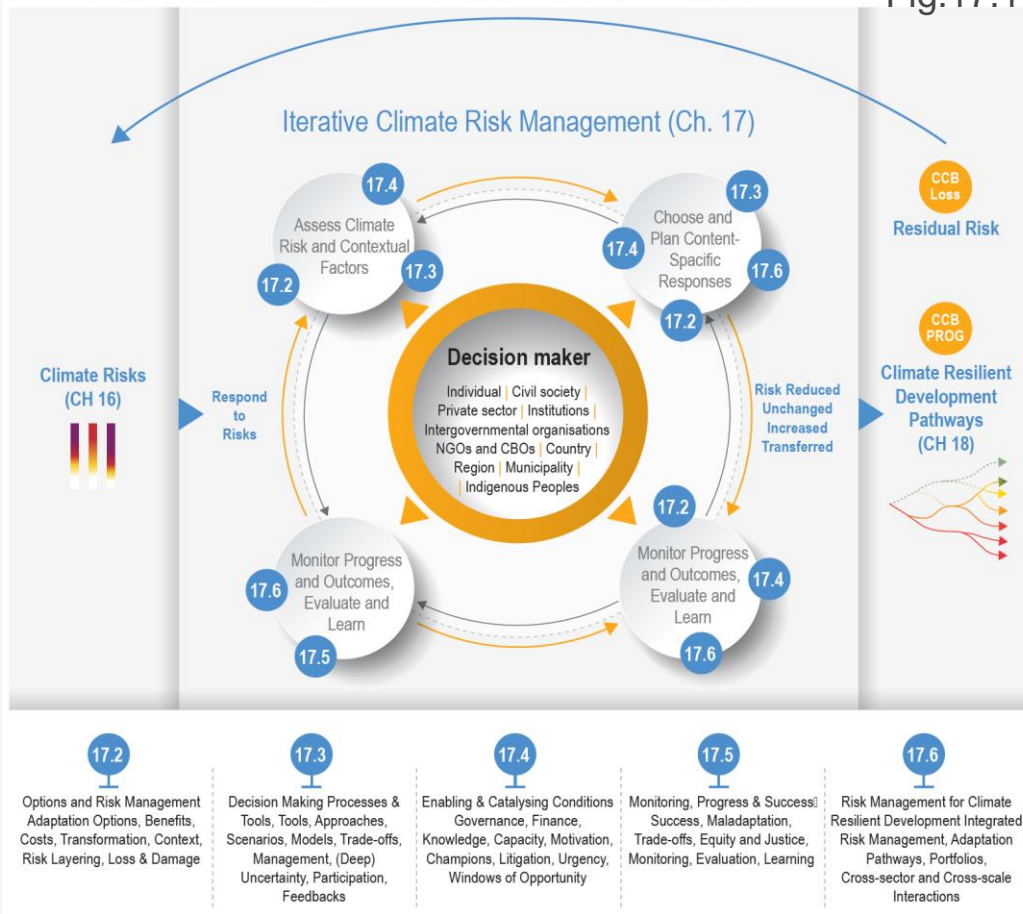


#ClimateReport #IPCC

[Axel Fassio/CIFOR Flickr CC BY-NC-ND / Unsplash]

Schematic representation of the climate risk management decision-making process

Fig.17.1



Chapter 17

Climate risk management comprises

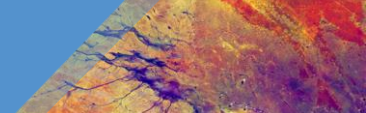
- vulnerability and risk assessments,
- identification of options,
- planning, implementation,
- monitoring, evaluation and review.

Ch17:

Options, processes and enabling conditions for climate risk management

Success and the risk of maladaptation, including how to monitor and evaluate

Integration of risk management across sectors, jurisdictions and time horizons



Tab.17.2

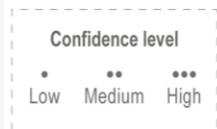
Adaptation options

... have been proposed, planned, or implemented across all sectors and regions, with prospects for wide-ranging benefits to nearly all people and ecosystems.

Benefit to humans and ecosystems

from representative adaptation options

Breadth of applicability of each adaptation option in its benefit to humans



Can reduce the exposure or vulnerability of **specific groups of people**
i.e. <1 billion people

Can reduce the exposure or vulnerability of **many people**
i.e. between 1–5 billion people

Can reduce the exposure or vulnerability of **most people in the world**
i.e. >5 billion people

Benefits of each adaptation option for ecosystems and ecosystem services

Highly beneficial

Moderately beneficial

No clear and different benefits / harms

Worsens the situation

Highly beneficial	- Ecosystem-based adaptation (•••)	- Minimizing ecosystem stressors (••)	- Nature restoration (•••) - Diets/food waste (•••)
Moderately beneficial	- Strategic coastal retreat (•••) - Efficient water use/demand (••) - Seasonal/temporary mobility (••) - Permanent migration (••)	- Diversification of livelihoods (••) - Farm/fishery practice (•••)	- Infrastructure retrofitting (•••) - Building codes (••) - Disaster early warning (•••) - Governance cooperation (••)
No clear and different benefits / harms	- Coastal accommodation (••) - Food storage/distribution (••) - Water supply/distribution (•)	- Social safety nets (•) - Water capture/storage (•)	- Spatial planning (•) - Availability of health infrastructure (••) - Access to health care (••)
Worsens the situation	- Coastal infrastructure (•••)	- Insurance (••)	



Kumerra Gemechu



India Waterportal



Axel Fassio

Enabling conditions

Governance

Finance

Information & Knowledge

Fig.17.2

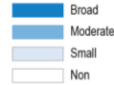
How are risk management options being run in society?

Who is doing the governing?



Relative amount of adaptations managed per governance sector

Transformational potential for systematic change



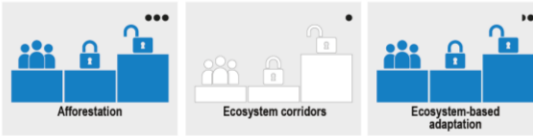
Confidence in its transformational potential



(a) Risk to coastal socio-ecological systems



(b) Risk to terrestrial & ocean ecosystems



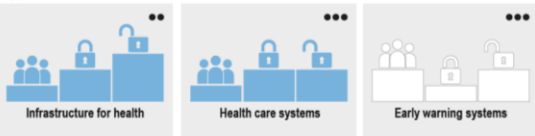
(c) Risks associated with critical physical infrastructure, networks & services



(d) Risk to living standards & equity



(e) Risk to human health



(f) Risk to food security



(g) Risk to water security



(h) Risk to peace & migration



(i) Do people choose to implement this option formally or informally?

Enabling conditions

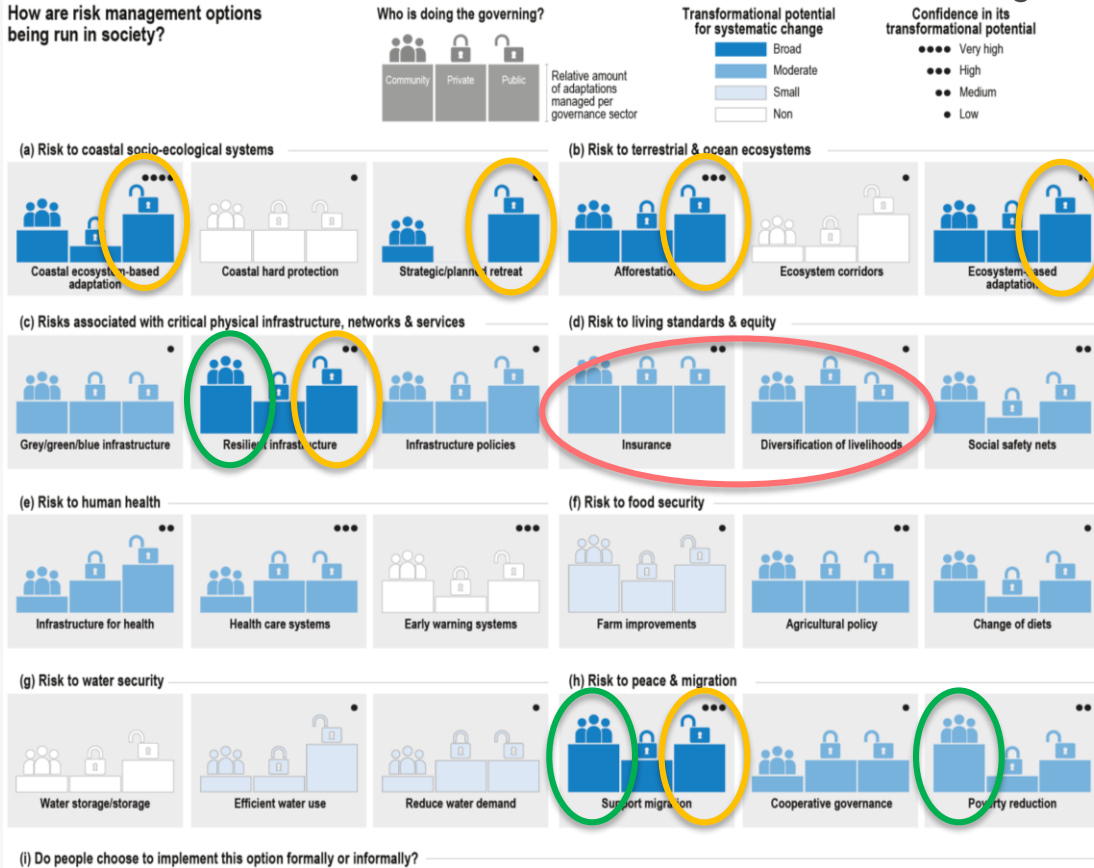
Governance

especially when inclusive and context-sensitive, is important.

Formal and informal approaches, often in polycentric arrangements of public, private and community actors recognised

Fig.17.2

How are risk management options being run in society?



Enabling conditions

Governance

especially when inclusive and context-sensitive, is important.

Formal and informal approaches, often in polycentric arrangements of public, private and community actors recognised

Public governance leadership has the largest role for adaptation

Private sector governance is important for insurance and for diversification of livelihoods

Communities and individuals play largest role for adaptations to farming and fishing, insurance, migration, resilient infrastructure, and poverty reduction



Enabling conditions

Governance

National and international legal and policy frameworks and instruments support adaptation, especially when combined with guidelines for action

A steady increase in national and sub-national laws, policies, along with regulations that mandate reporting and risk disclosure have promoted adaptation

Greater adaptation is present where national climate laws and policies require adaptation action from lower levels of government **and include guidelines on how to do so**

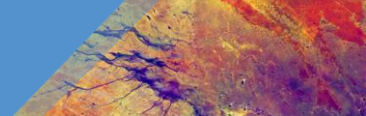
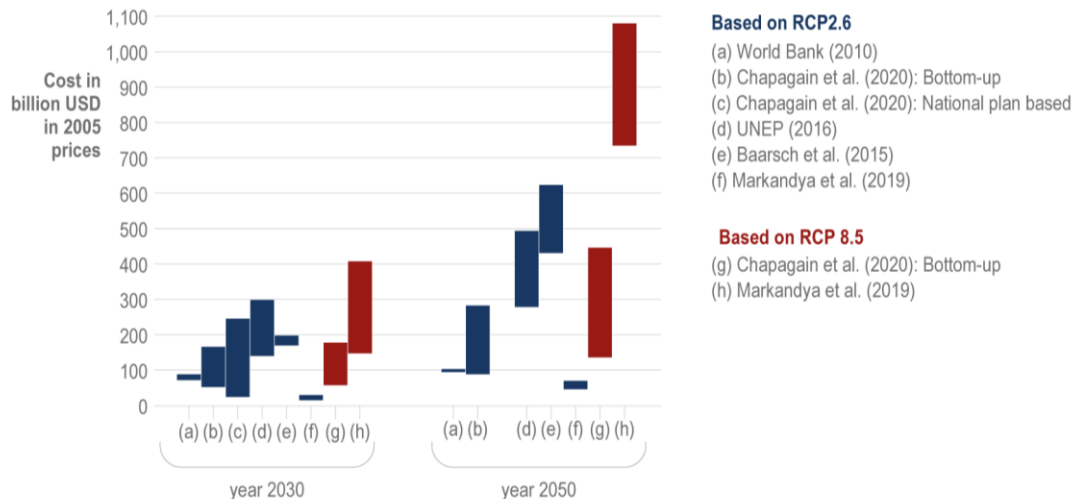


Fig.CCB FINANCE.1

Comparison of recent studies that estimated developing country adaptation costs

in billion USD (in 2005 prices) per year for 2030 and 2050



Based on RCP2.6

- (a) World Bank (2010)
- (b) Chapagain et al. (2020): Bottom-up
- (c) Chapagain et al. (2020): National plan based
- (d) UNEP (2016)
- (e) Baarsch et al. (2015)
- (f) Markandya et al. (2019)

Based on RCP 8.5

- (g) Chapagain et al. (2020): Bottom-up
- (h) Markandya et al. (2019)

Enabling conditions

Finance

Since AR5, gap between estimated costs of adaptation and the documented (tracked) adaptation finance has widened

Estimates vary due to differences in assumptions, methods, and data

Absolute estimated adaptation cost higher for developed countries, but for developing countries higher as % of national income

→ Self-financing difficult

→ Underscoring the crucial role of international finance

Climate finance (mitigation and adaptation) Copenhagen commitment from developed for developing countries in 2020: 100 USD billion/ year not met

Estimated adaptation costs of developing countries ~127 billion USD/ year (2030) and almost ~300 billion USD/ year (2050)

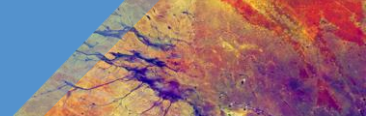
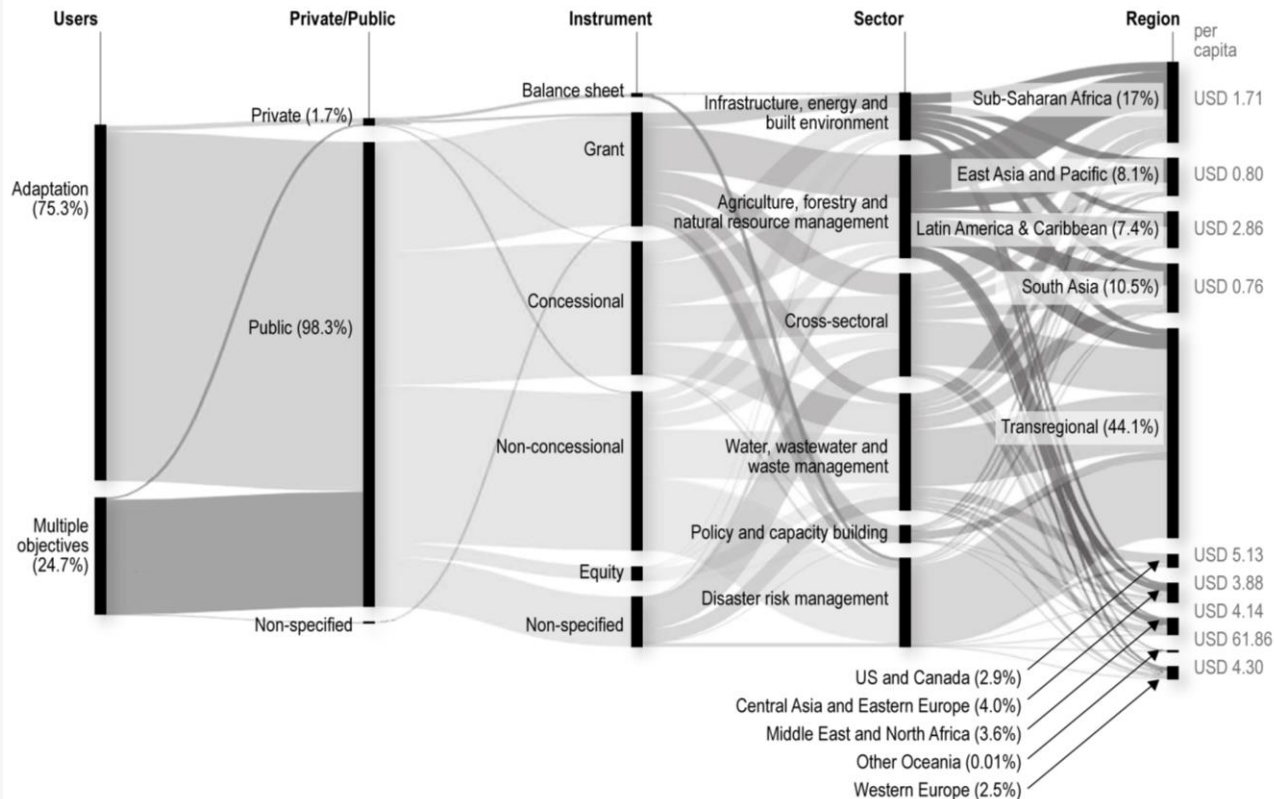


Fig.CCB FINANCE.2

Flow and distribution of globally tracked adaptation and resilience finance in 2018 from different sources, through different instruments into different sectors and regions



Enabling conditions

Finance

Private sector financing for adaptation has been increasingly promoted but is limited, especially in developing countries

Key challenge for private sector financing: demonstrating financial return on investment

Even more difficult in developing countries because of risk (perceived and real) to investors



Axel Fassio

Enabling conditions

Information & Knowledge

Climate services: Utility strengthened by sustained engagement between stakeholders and experts

Significant gaps in the evaluation of climate services

Some studies indicate gaps in reaching the most vulnerable and more isolated people



Anas Meister



Chris Ghallagher



Enabling conditions

Information & Knowledge

Catalyzing conditions/ windows of opportunity: Stimulate more rapid uptake of existing and new adaptation options

Disaster events or shocks, i.e. wildfires, tropical cyclones, heatwaves or coral bleaching have catalyzing characteristics

Climate litigation and decision innovators/ climate leaders, e.g. in cities

Litigation becoming more frequent and expected to increase as climate impact attribution science matures further

Fig. 17.8

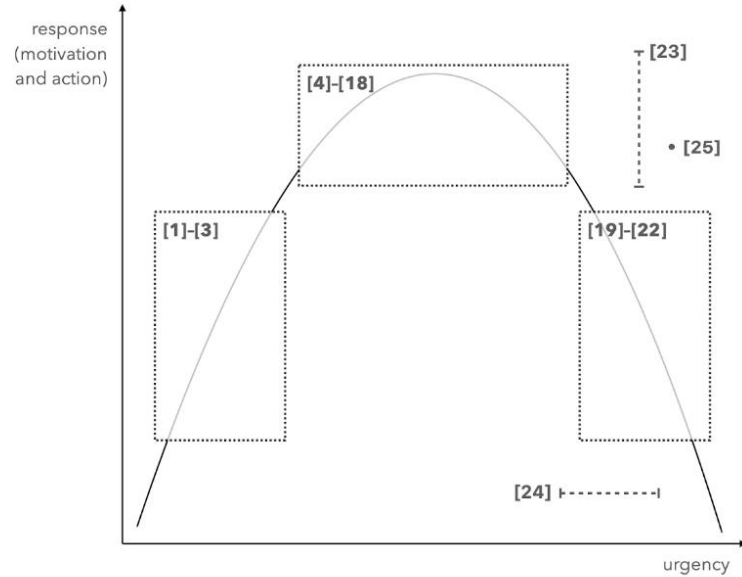


Figure 4: Relationship between attention/action and the levels of urgency as found by climate-specific decision

1. van Slobbe et al. (2016)
2. Funk et al. (2019)
3. Gabillet et al. (2020)
4. Rinscheid et al. (2020)
5. Rinscheid & Wüstenhagen (2019)
6. Rooney-Varga et al. (2018)
7. McMichael et al. (2019)
8. Gonzales & Ajami (2017)
9. Booysen et al. (2019a)
10. Booysen et al. (2019b)
11. Joubert & Ziervogel (2019)
12. Stavenhagen et al. (2018)
13. Archie et al. (2018)
14. Pot et al. (2019)
15. Donner & Webber (2014)
16. Kam et al. (2019)
17. Bolorinos et al. (2020)
18. Madsen et al. (2019)
19. Amelung & Funke (2015)
20. Robins (2019)
21. Asfaw et al. (2019)
22. Gee & Anguiano (2020)
23. Lohse et al. (2017)
24. Nanda et al. (2018)
25. Bodin et al. (2019)

Enabling conditions

Information & Knowledge

Urgency can stimulate prompt climate risk management.

A moderate level of urgency contributes to enhanced climate action, while both high and low levels of urgency can impede response

Well-designed communication strategies can move decision makers from low to moderate levels of urgency

→ @1.1C: COVID-19, war in Ukraine: disasters are drawing resources & pose opportunities
 → @higher warming: disasters increase, drawing more resources & limiting action for long-term change



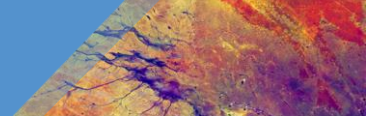
Decision processes

Decision support tools and decision-analytic methods are available

... and can support deliberative processes where stakeholders jointly consider change and uncertainties, associated impacts and adaptation needed along multiple pathways and scenarios of future risks

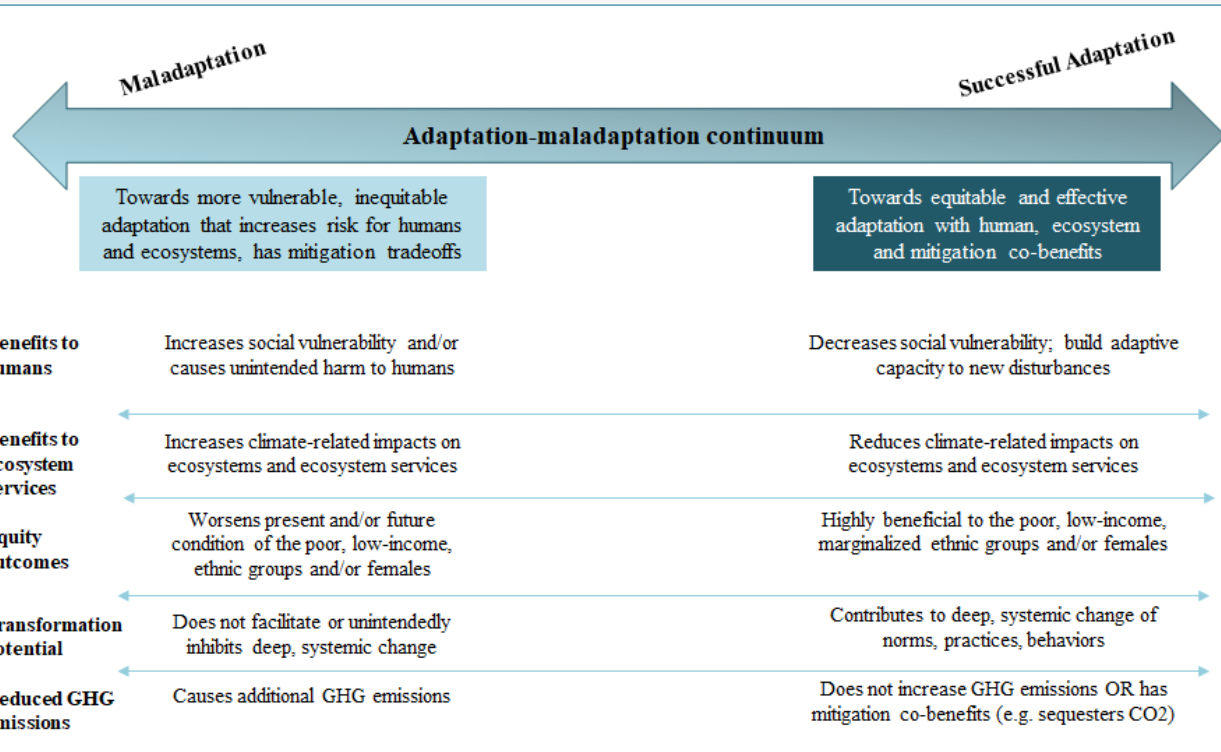
“Robust decision-making”, to determine ‘no regrets’ options amongst trade-offs





Successful adaptation

Fig. Ch17.9

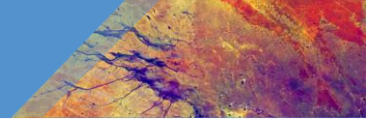


Successful adaptation and maladaptation form the opposite poles of a continuum

Adaptation options assessed acc. to e.g.

- benefits to humans,
- benefits to ecosystem services,
- benefits to equity (marginalized ethnic groups, gender, low-income populations),
- transformational potential, and
- contribution to greenhouse gas emission reduction

(Co-)benefits vs trade-offs can facilitate successful adaptation and reduce likelihood of maladaptation



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

Fig. Ch17.10

Successful adaptation



Success is greatest when adaptation enhances gender equity and supports ecosystem function and services.

High potential for successful adaptation:

- nature restoration, social safety nets, & changing diets and reducing food waste

E.g. largest potential for maladaptation:

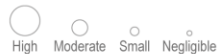
- coastal infrastructure & accommodation

Transformational adaptation increasingly necessary at higher global warming levels.

- High transformative potential: migration, spatial planning, governance cooperation, universal access to healthcare, changing food systems

- Incremental change: early warning systems, insurance, and improved water use efficiency

Potential contribution to the risk of maladaptation to climate change

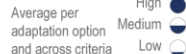


na = Information not available in the literature considered (i.e. essentially from AR6 WGII underlying chapters)

Average score per adaptation option

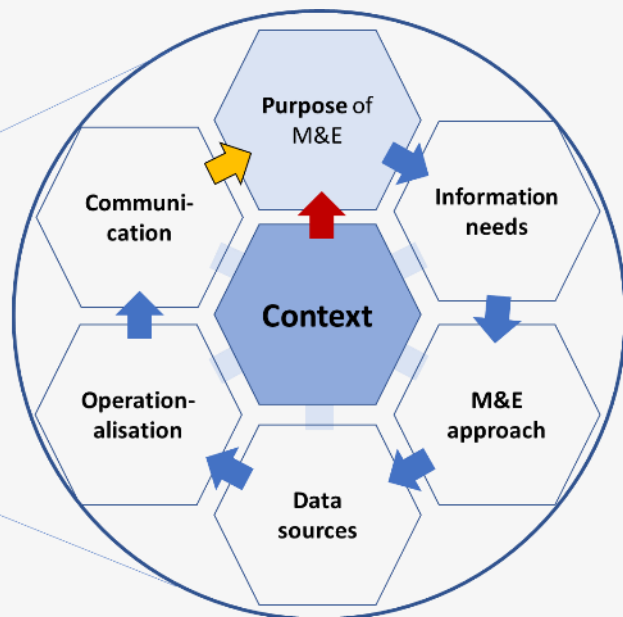


Confidence levels



Successful adaptation

Fig. Ch17.11



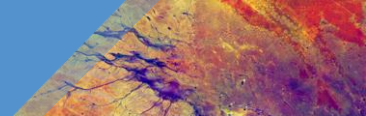
Monitoring and evaluation (M&E) are key for iterative climate risk management, in particular tracking adaptation progress and learning about adaptation success and maladaptation

M&E application has increased since AR5, but is at an early stage in most countries and underutilized for assessing adaptation outcomes at longer timeframes

- About 1/3 of countries have national adaptation M&E systems, 1/6 are reporting on implementation

Effective climate risk management:

- systematically integrating adaptations across interacting climate risks & jurisdictional scales,
- considering success factors and climate resilient development, and accounting for the dynamic nature of climate risks over time



Dr. Diana Reckien

University of Twente

d.reckien@utwente.nl

For More Information:

 www.ipcc.ch

 IPCC Secretariat: ipcc-sec@wmo.int

IPCC Press Office: ipcc-media@wmo.int

Follow Us:

 /  @IPCC

 @IPCC_CH #IPCCReport

 [linkedin.com/company/ipcc](https://www.linkedin.com/company/ipcc)