

ECONADAPT

The Economics of Adaptation

Summary of the ECONADAPT project

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- ECONADAPT is a research project funded by the European Union Seventh Framework Programme (FP7).
- The central purpose of the project is to build the knowledge base on the economics of adaptation, and to convert this new knowledge into practical information for decision makers to help support adaptation planning.
- The project commenced in October 2013 and runs for 36 months

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Introduction

- The ECONADAPT project is co-ordinated by University of Bath, UK and involves 14 teams from across Europe



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BATH

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AGRICULTURAL UNIVERSITY OF ATHENS

bc³

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Klima Aldaketa Ikergai



cmcc
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**eco
logic**



IVM Institute for
Environmental Studies

Paul Watkiss Associates



POTSDAM INSTITUTE FOR
CLIMATE IMPACT RESEARCH

UEA
University of East Anglia



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Policy Context

- Support the application of adaptation economics following publication of the EU's 2013 Adaptation Strategy, with particular focus on
- *Action 4: Bridge the knowledge gap.*
key knowledge gaps include:
 - - *information on damage and adaptation costs and benefits;*
 - - *frameworks, models and tools to support decision-making and to assess how effective*

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Major Research Themes

- The project frames the overall research by asking two questions, each addressed in a separate but linked work stream.
- First, what are the key methodological advances needed to improve the economic assessment of adaptation?
- Second, how can improved economic methods and tools be applied in the context of the big adaptation decisions facing Europe in the next decade?

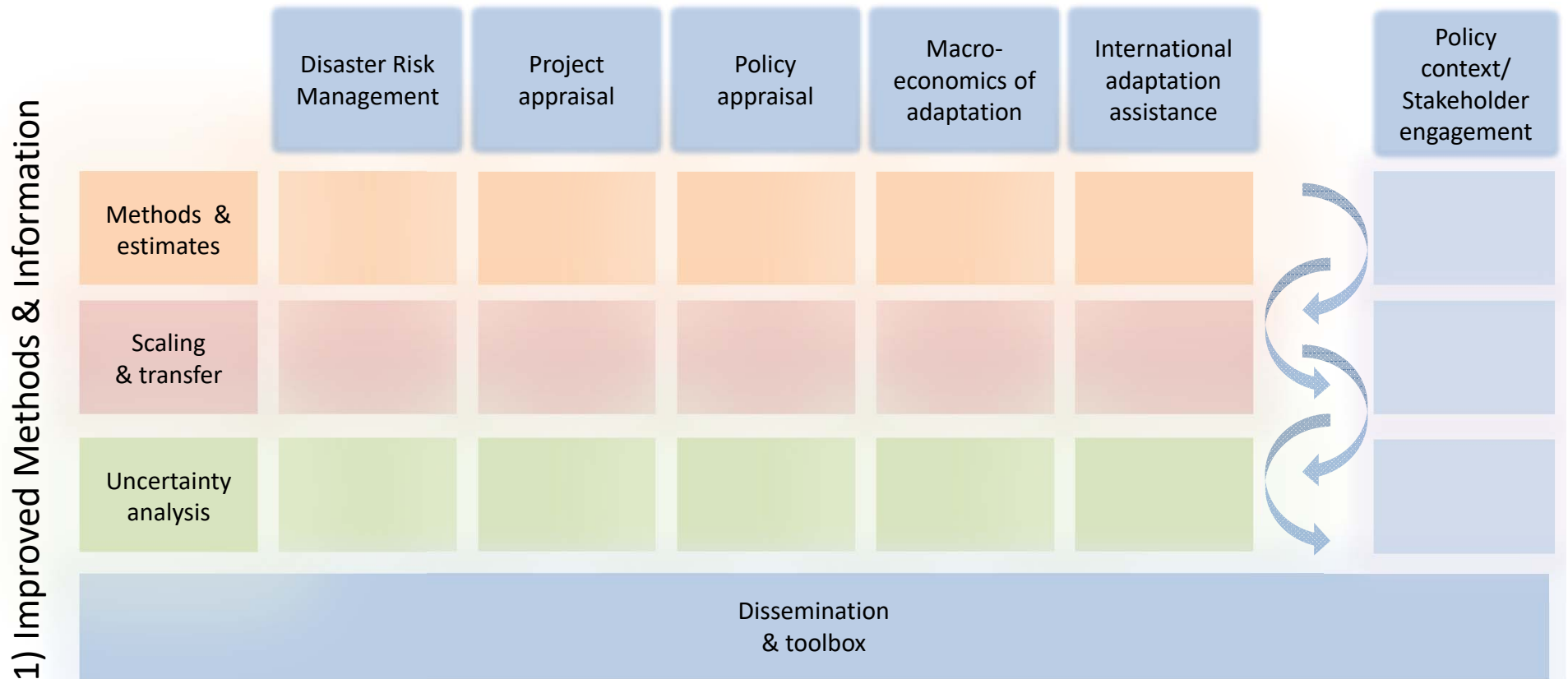
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Linking research and policy domains

2) Policy use domains



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Objectives

- To focus on user needs, defined by stakeholder involvement throughout, that inform the methodological and empirical advances to be made;
- To embed economic assessment within a framework that incorporates the interaction of adaptation decisions within existing policies, current policy developments and other socio-economic trends;
- To develop approaches that better encourage and facilitate consistency in the treatment of scale, uncertainty, aggregation and transferability in various forms of economic assessments of adaptation
- To facilitate the expansion - compared to previous economic analyses - of the range of adaptation actions, and types of costs and benefits considered, in analytical practice

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Policy Framework and Lessons

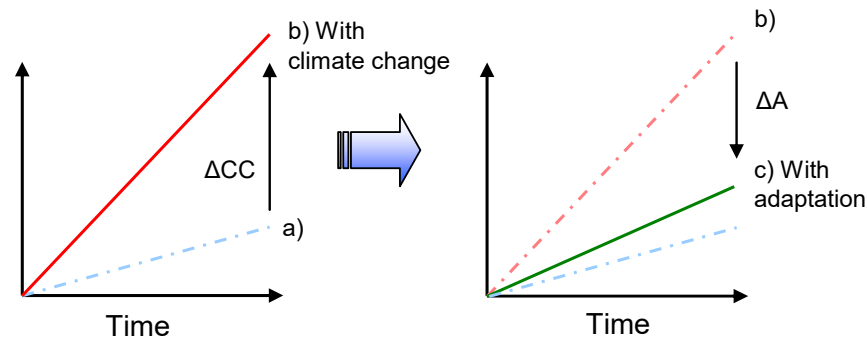
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The times they are a changing

- Existing 'science' based approach for climate change impacts and adaptation
 - Start climate model, run impact model, identify adaptation



- Key headlines, but own, not provide information for policy
- Or address uncertainty challenge (if-then)
- Need different information for practical implementation

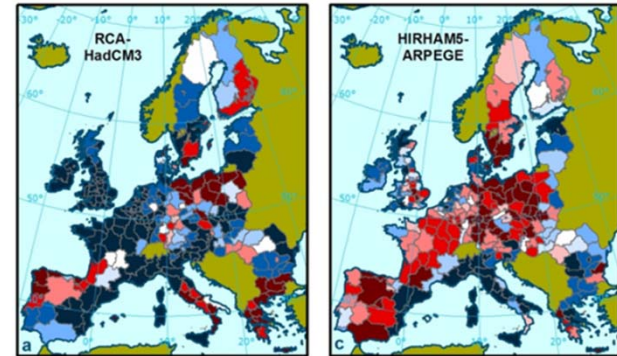
ECONADAPT focus

- Use a policy-first or decision-first approach
- Focused on what to do now (next decade) not what to do in 2040*
- Integrate adaptation (mainstream) into planning and programming
- Identify risks and options using iterative climate risk management approach
- Use economic analysis to justify intervention and help prioritise options
- Use economics to help consider how to implement, i.e. address barriers, deliver effectiveness and efficiency

And addressing adaptation challenges

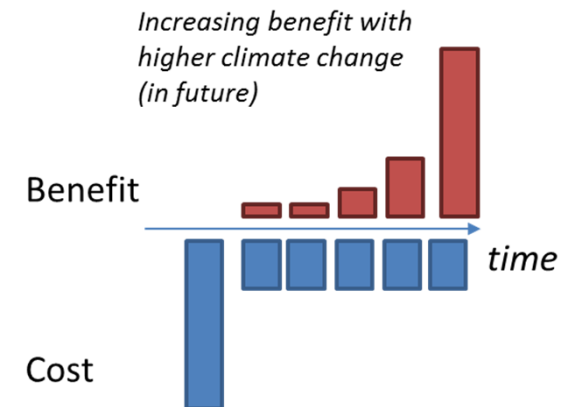
Difficult to estimate the benefits (and even costs) of adaptation and justify

- 1) Climate change involves uncertainty –
 - 2 or 4°C –
 - as well different climate models



- 2) Adaptation is site and context specific - no simple common metrics (e.g. like CO₂, and £/tCO₂) – difficult to estimate the benefits

- 3) For medium to long term adaptation benefits mostly in future under climate change more difficult to justify early costs (discounting)

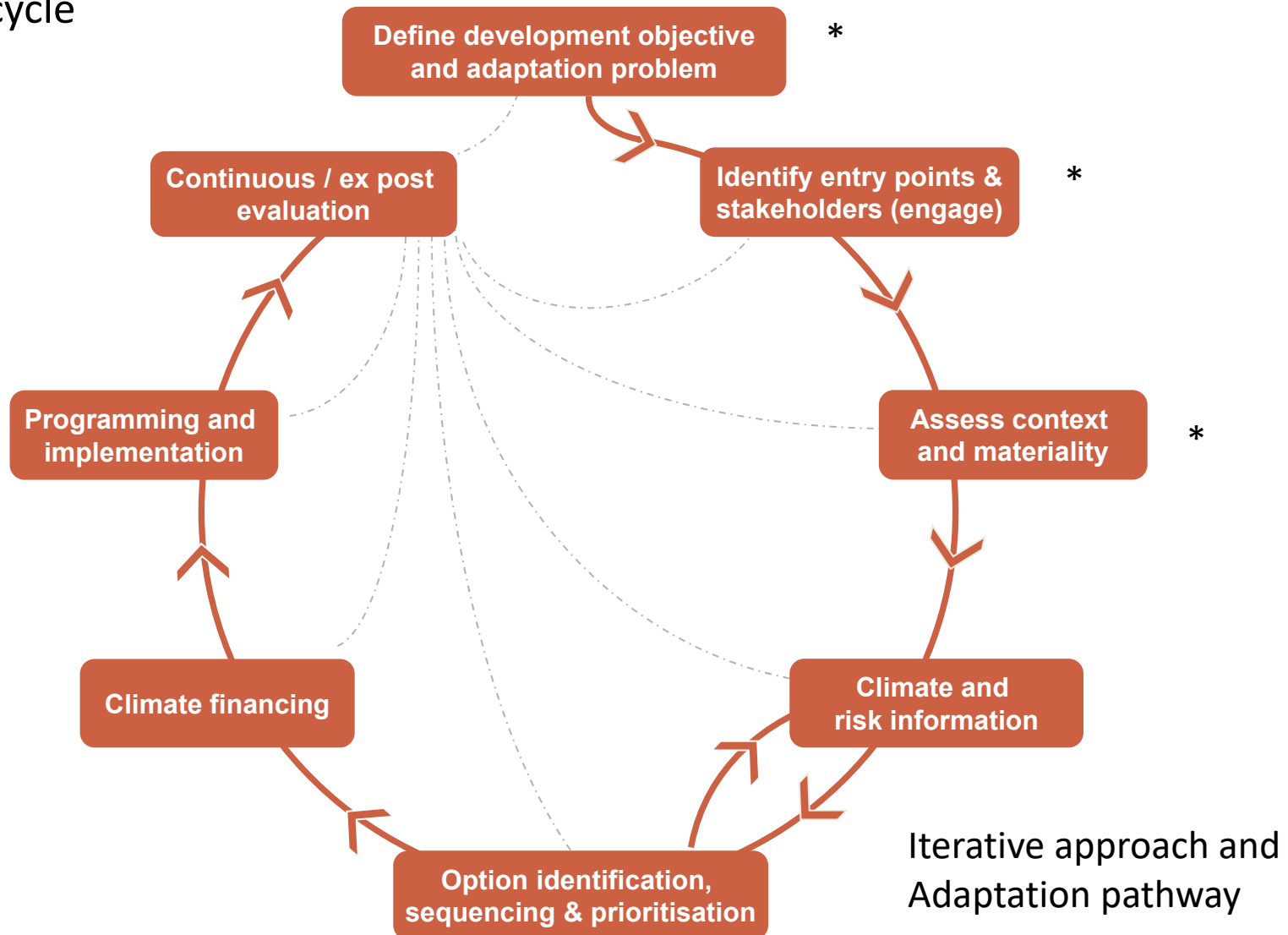


ECONADAPT approach

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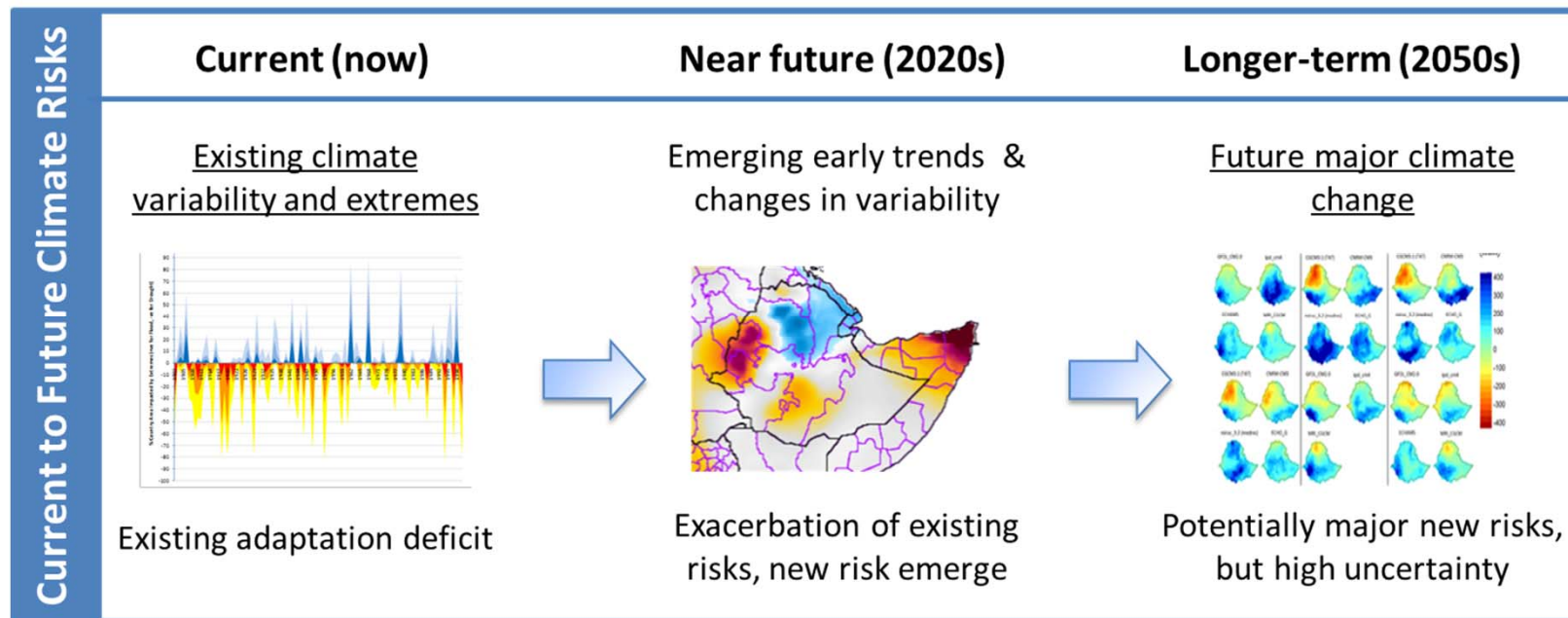
1) Policy cycle



Iterative climate risk management

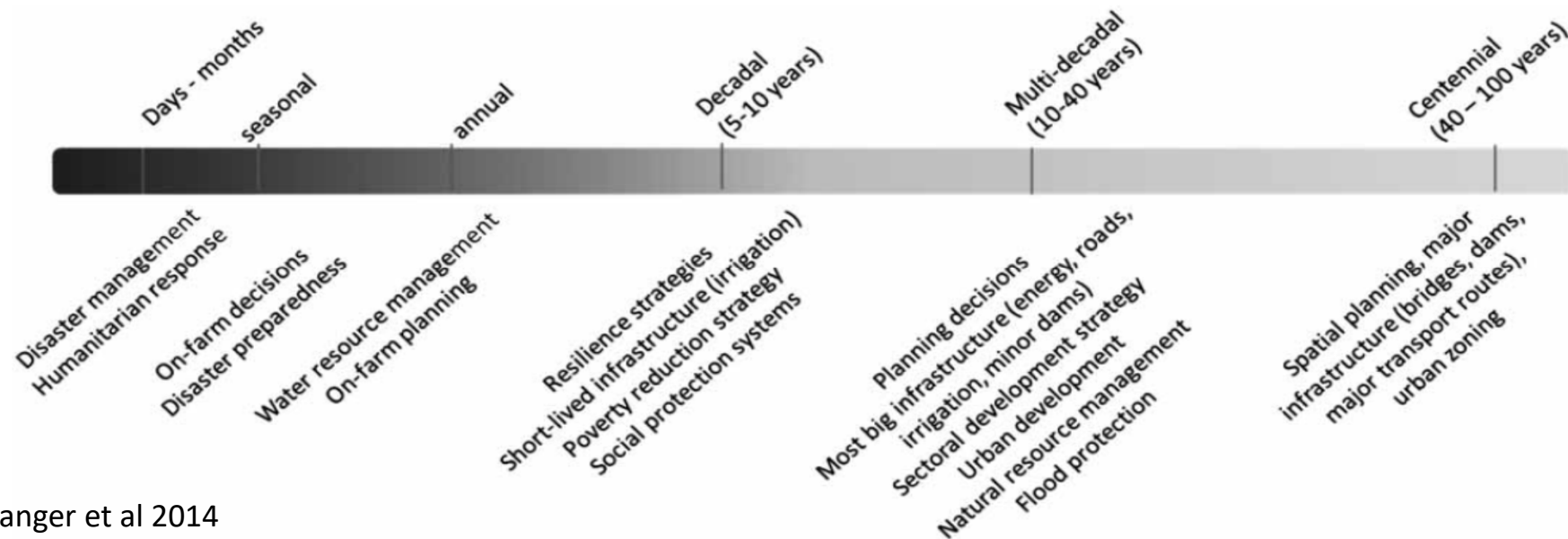
2) Iterative climate risk management recommend in the IPCC 5th AR

- Start with current climate and moves to future, looking at uncertainty



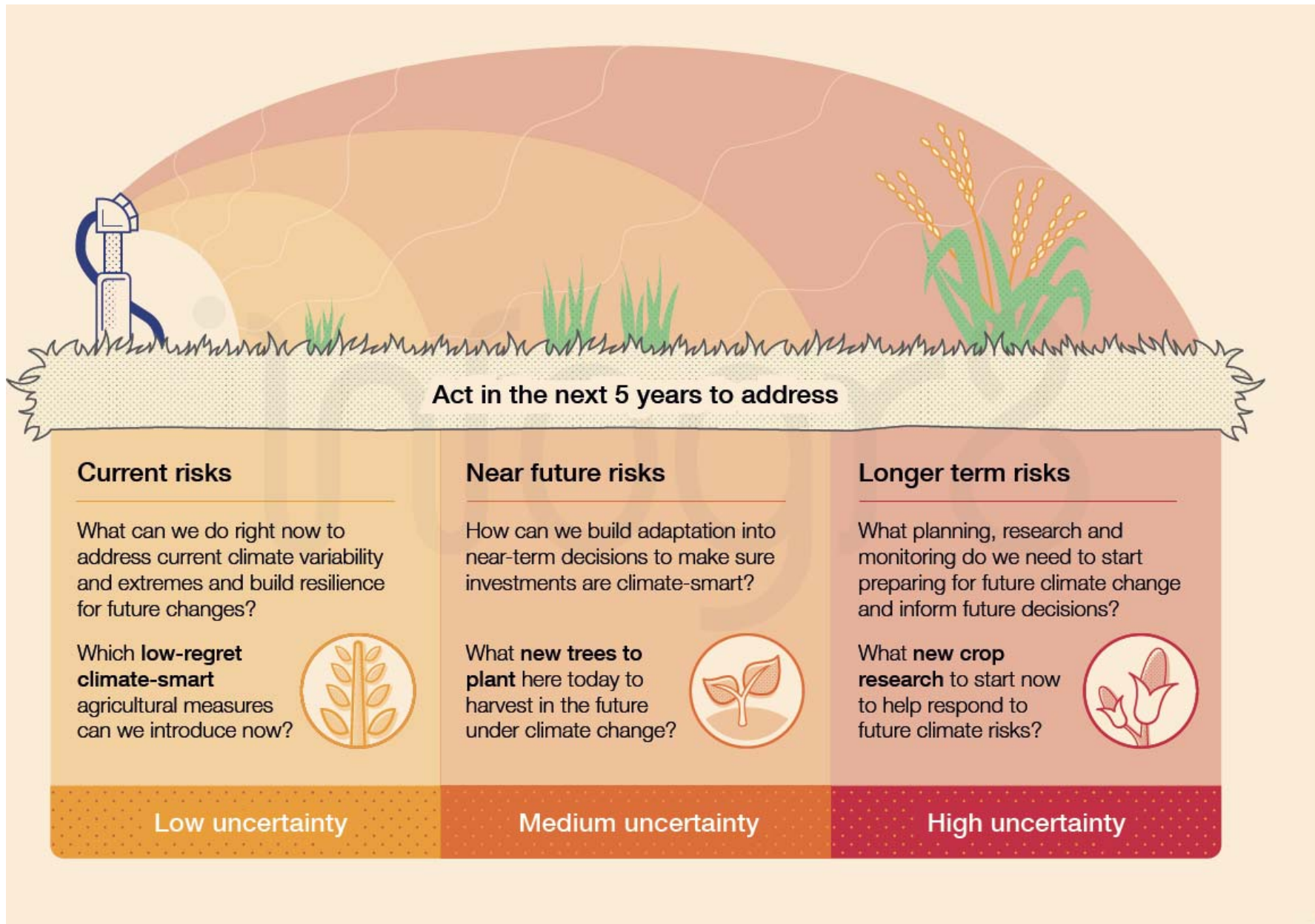
Linking to decision life-time

- Decision have different life-times, which influence whether we need to act now versus where we can wait, learn and act in the future
- Help identify which decisions (in next decade) involve lock-in, and will be exposed to future climate change (infrastructure or land-use plans)



The timing and phasing of adaptation

- Combine to look at the sequencing and timing of adaptation - three types of decision contexts and actions (building blocks)
 - Action to address current climate variability and extremes now, that also build resilience for future, so called 'low regret'. Early economic benefit*
 - Decisions which have a long life time (e.g. infrastructure, planning) – incorporating risk screening, flexibility, robustness (climate smart)
 - Preparing for future long-term risks, taking account of future uncertainty – focusing on learning and the value of information
- At programme level, need a portfolio of all three of these. BUT each requires different economic approach



So what?



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- This is rather important....
 - Changes the approach but also the choice of options (not just technical)
 - Affects costs (and benefits) of options
 - We need to be careful in looking at literature or existing costs/benefits, i.e. are estimates based on if-then or iterative approach
 - Changes the decision-support approach we may use for adaptation appraisal
 - While many positive aspects – and producing more policy relevant outputs - experience (project) is difficult to communicate and involves more work

Costs and Benefits of Adaptation: Evidence, Lessons and Policy Insights

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State of knowledge on Costs/Benefits

- Previous reviews – including IPCC 5th AR - report a low evidence base on the costs and benefits of adaptation
- But over the last few years, information base grown very strongly
- Global initiatives (e.g. World Bank EACC, UNFCCC NEEDs, OECD, UNDP)
- National initiatives (National Adaptation Plans, etc)
- Risk, sector and project based assessments
- ECONADAPT undertaken comprehensive review – built an ‘Inventory of studies’ - identified > 600 relevant studies

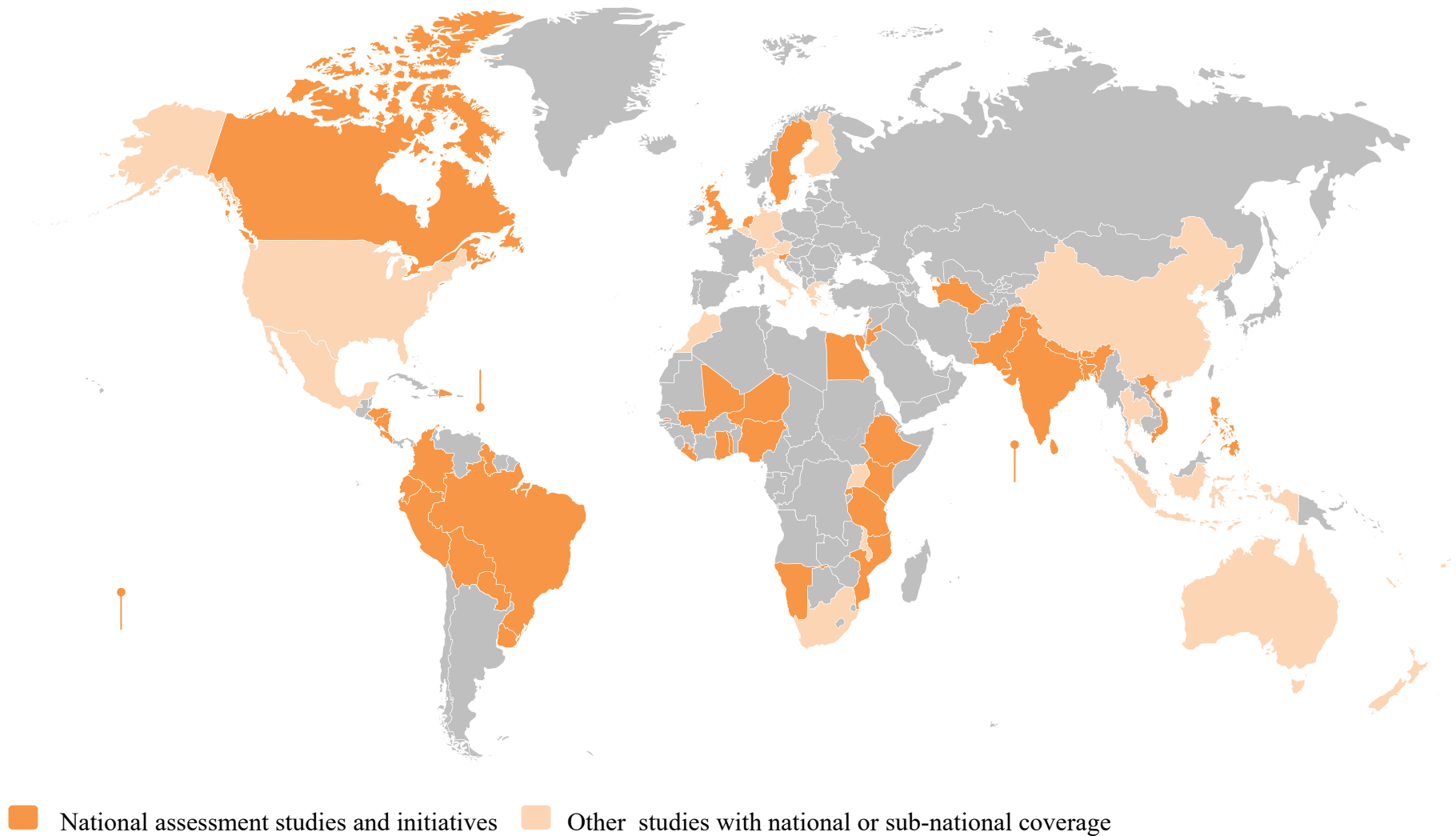
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Coverage of national studies

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Coverage of Sectors/Risks

Update of 2008 review

Watkiss et al, 2015

Risk / Sector	Coverage/ Discussion	Cost estimates	Benefit estimates
Coastal zones and coastal storms	Comprehensive coverage at global, national and local level in impact assessment and policy studies + low regret options decision making under uncertainty.	✓✓✓	✓✓✓
Floods including infrastructure	Growing cost and benefit estimates in a number of countries and local areas, particularly river flooding. Some evidence on low regret options and non-technical options. Some applications of decision making under uncertainty.	✓✓	✓✓
Water management	Emerging supply-demand studies at the national level. Focus on supply, engineering measures. Some examples of decision making under uncertainty.	✓✓	✓
Other infrastructure	Several studies on road and rail infrastructure. Examples of wind storm and permafrost.	✓	✓
Agriculture	Benefits of farm level adaptation, and some benefits and costs at global and national level. Evidence emerging on low regret adaptation, including climate smart agriculture.	✓✓	✓✓
Over-heating (built environment, energy and health)	Good cost information on heat-alert schemes. Increasing coverage of autonomous costs* associated with cooling. Growing evidence base on low-regret options (e.g. passive cooling).	✓✓	✓
Other health risks	Increasing studies of preventative costs for future disease burden (e.g. water, food and vector borne disease), but partial.	✓	✓
Biodiversity / ecosystem services	Low evidence base, with a limited number of studies on restoration costs and costs for management of protected areas for terrestrial ecosystems.	✓	
Business, services and industry	Very few quantitative studies available, except for tourism,.	✓	

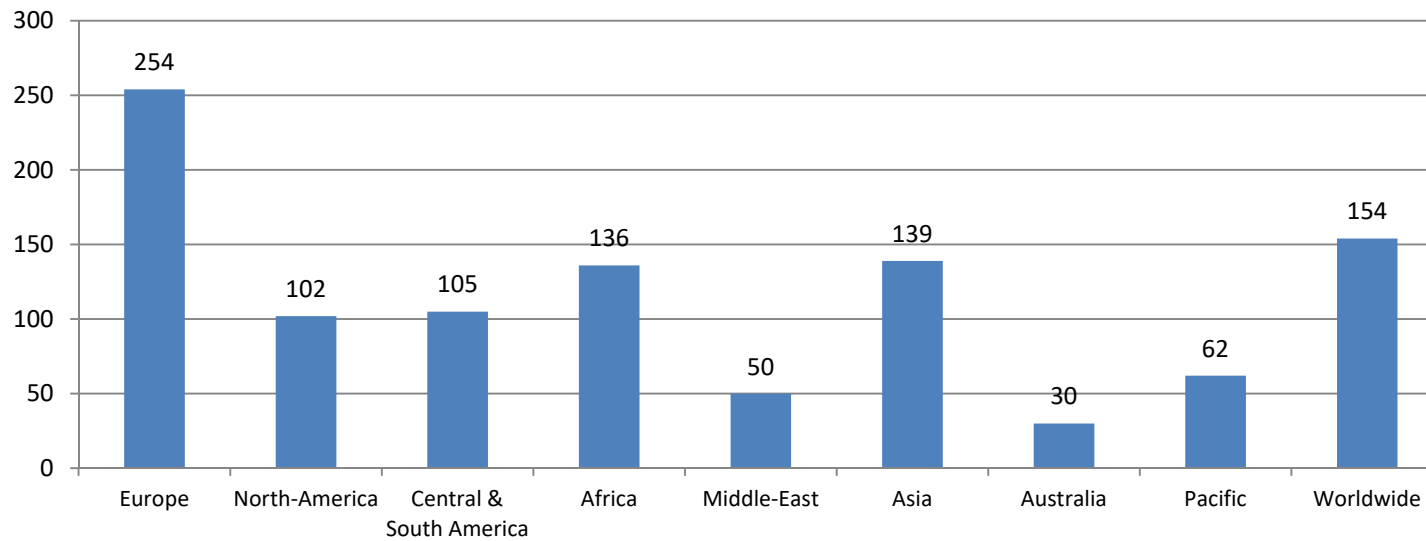
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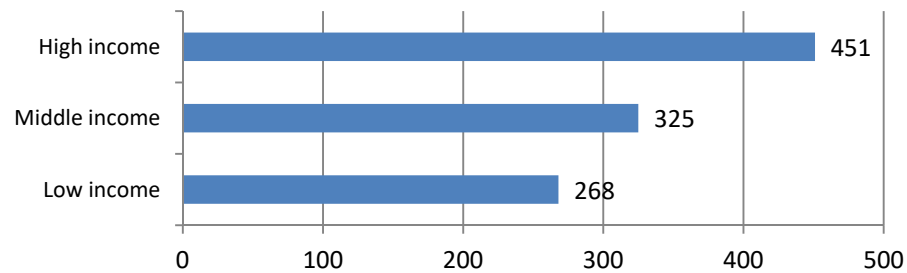
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Geographical Coverage

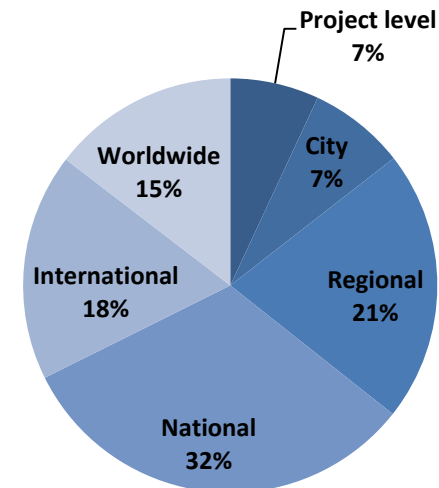
Geographical area (total 692, multiple answers possible)



Economic context (total 692, multiple answers possible)

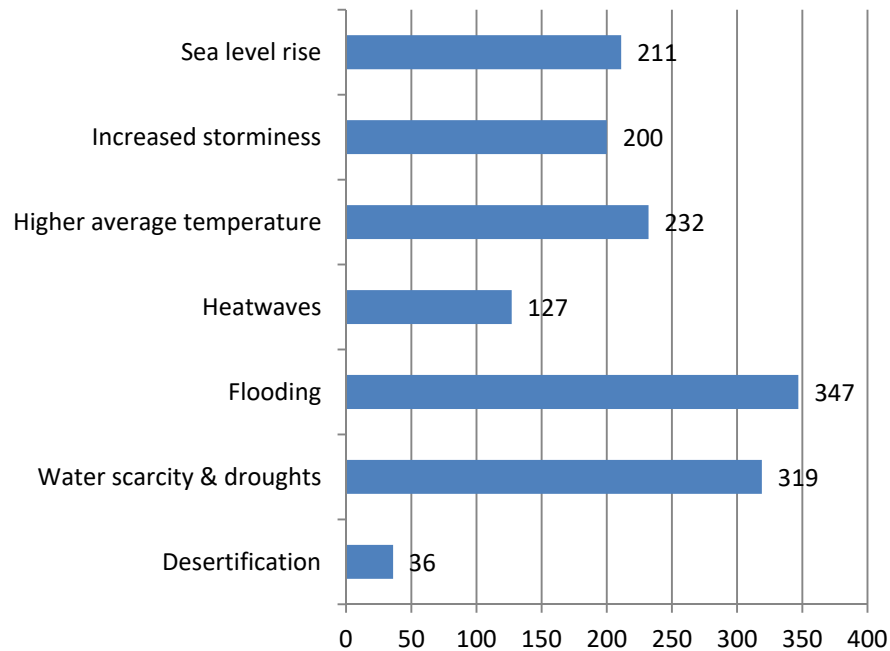


Scale, Total: 692

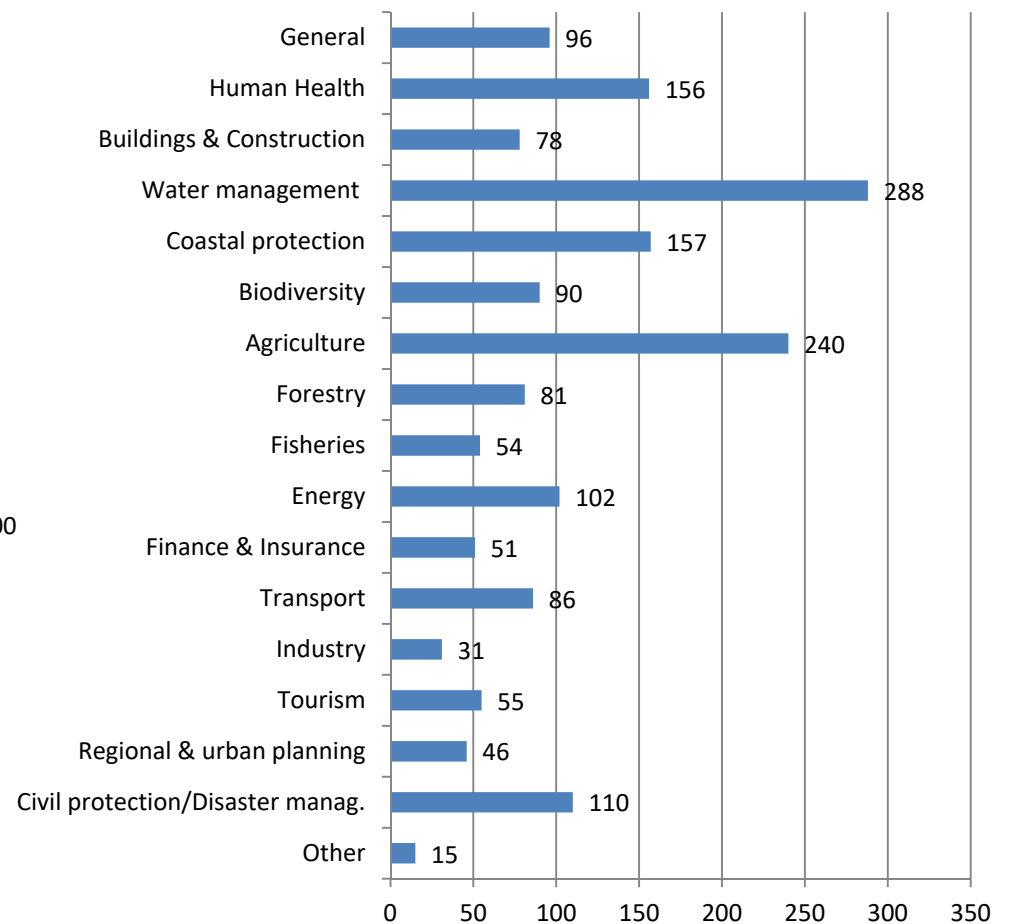


Risks and sectors

Climate risks considered (total 692, multiple answers possible)



Policy areas (total 692, multiple answers possible)



Source Econadapt Inventory

Insights

- Information base on the costs and benefits of adaptation has significantly grown in recent years
- Wider coverage of risks
- Broader geographical coverage
- But still partial - still low in some areas (ecosystems, business/industry, cross-cutting)
- And differences in literature emerging: 1) classic technical studies versus 2) new policy studies (the latter often including uncertainty)

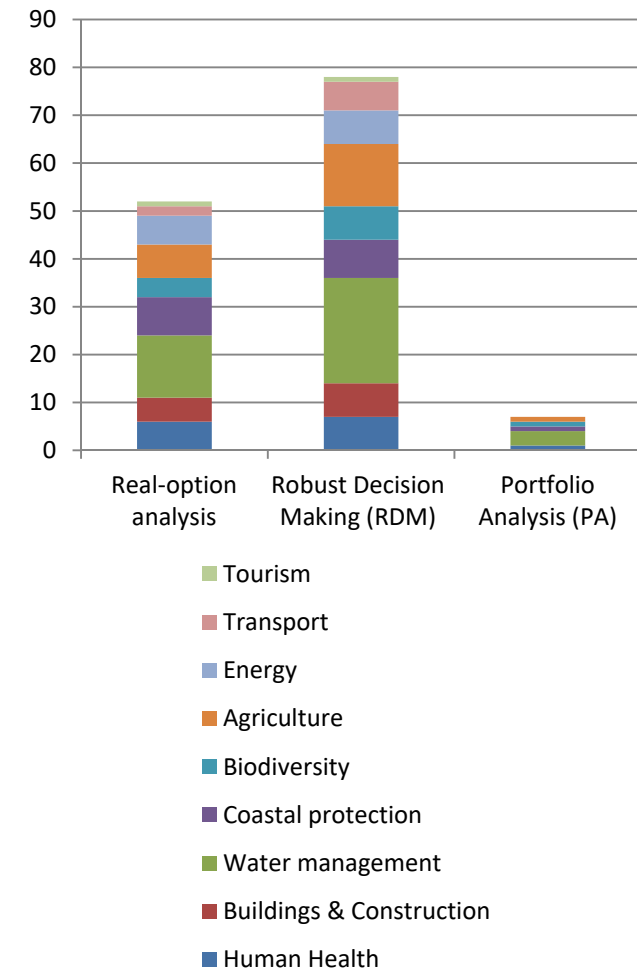
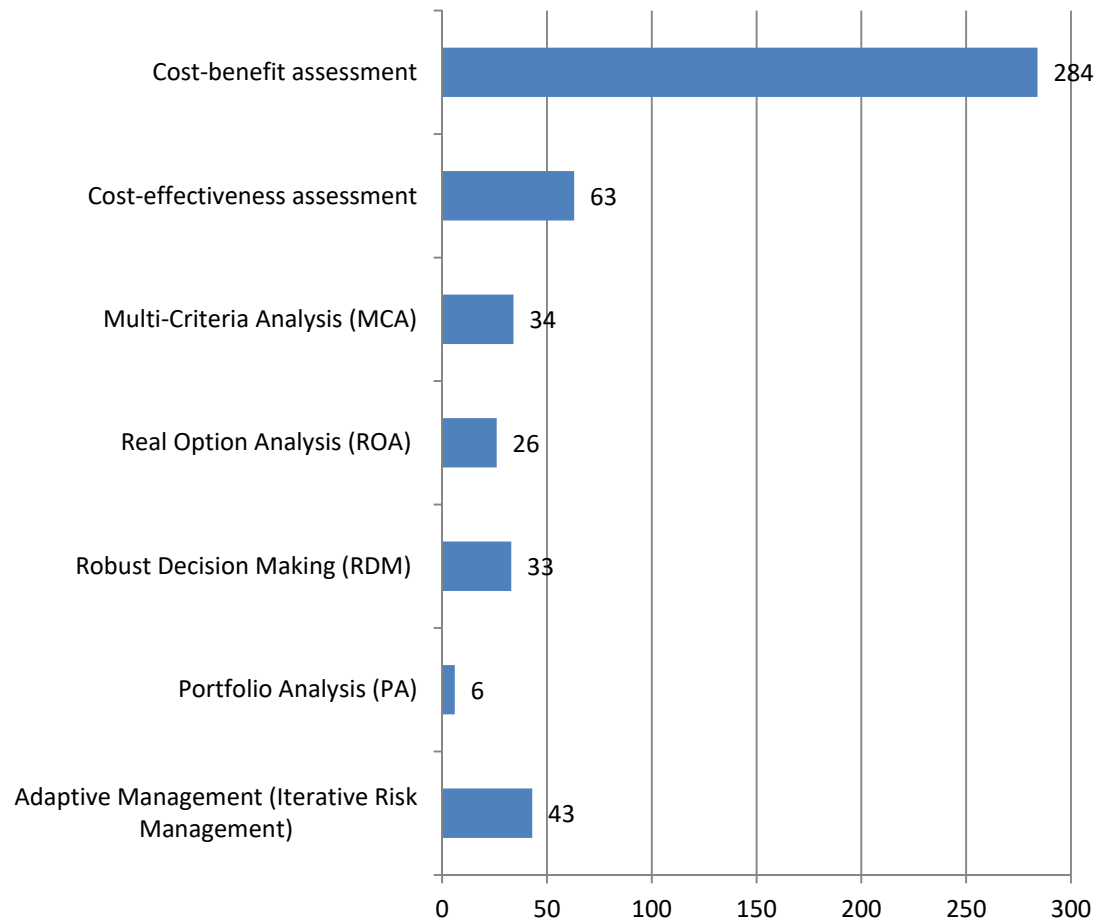




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- Generally find that costs increase as move to implementation (policy studies have higher costs than technical studies): why?
 - Existing policy objectives and standards are higher than ‘optimal’
 - The need to consider multiple risks and uncertainty, not just climate
 - The incorporation of uncertainty
 - The additional opportunity and transaction costs associated with policy implementation
 - The additional management costs with implementation (design, management, monitoring and evaluation)

Additional issue 2

- Increasing number studies on decision making under uncertainty



Conclusion

- Evidence base is growing
- There is no single 'cost' of adaptation
- Moving to new methods and approaches
- Alters the method, options and costs – care in using information
- Decision support for decisions evolving
- But critical to look at pragmatic approaches and existing policy

- Published in e-book at www.econadapt.eu