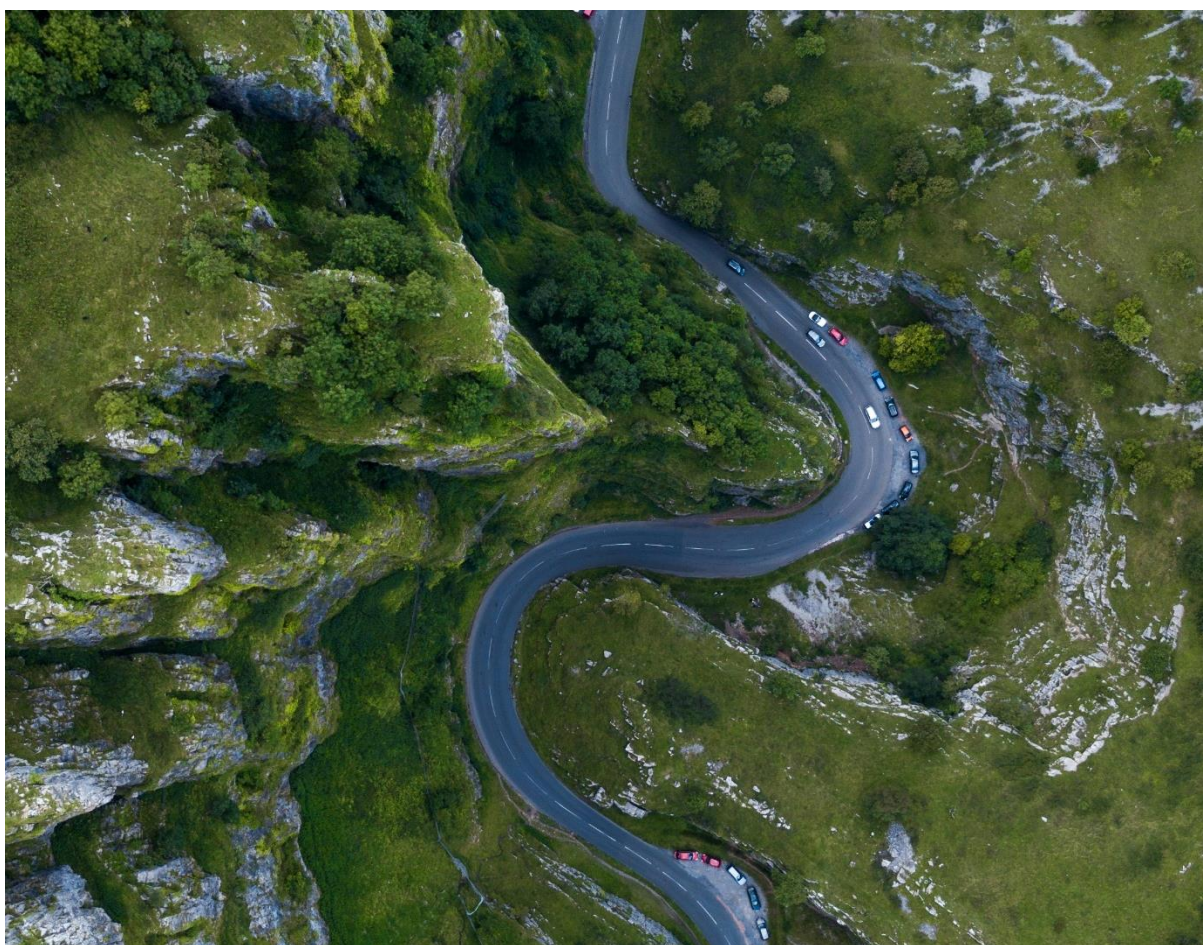

Climate Change Adaptation: Priority Research Areas

Workshop report
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Contents

| | |
|--|---|
| Introduction..... | 3 |
| Summary of the research gaps identified..... | 4 |
| Data, Metrics, Indicators, and Measurement | 4 |
| Interlinkages Between Sectors, Systems Thinking, and Quantifying Co-Benefits | 4 |
| Understanding and scaling-up ‘what works’ | 5 |
| Unintended consequences and unequal impacts | 5 |
| Behavioural insights | 6 |
| Awareness raising, public engagement and trust | 6 |
| Governance and Partnership Working..... | 6 |
| Finance | 7 |
| About the workshops | 8 |

Introduction

Adaptation is critical to ensure that people, communities, businesses, and natural systems are resilient to the inevitable impacts of climate change, including more frequent and severe flooding, heatwaves, and other extreme weather events. Proactive adaptation measures not only protect lives and livelihoods, but also ensure long-term resilience, reducing the overall costs and disruptions associated with climate-related hazards.

However, the UK faces significant challenges in adapting to climate change. While current policy is coordinated via the National Adaptation Programme (NAP) in England, there remain critical gaps in implementation and effectiveness. Its most recent iteration (NAP3), which was published in July 2023, was criticised by the [Climate Change Committee](#) for falling “far short of what is needed”. Experts have also pointed out that the NAP lacks sufficient funding, clear targets, and measurable outcomes, which hamper its ability to drive substantial progress¹².

While the NAP provides a structured framework, it is evident that much more could be done to improve delivery in key areas, including ensuring effective implementation and addressing existing evidence gaps. Robust research remains essential to tackle outstanding issues where evidence is limited, and to ensure the effective delivery of adaptation strategies, as recommended in the CCC’s “10 principles for good adaptation”³. Recognising this need, the Imperial Policy Forum and the Grantham Institute convened a series of workshops in May and June 2024 to identify priority areas for future research in climate adaptation, with a focus on integrating climate resilience into health, water management, and the built environment. This report synthesises the overarching findings from these workshops, highlighting common themes and potential research questions that could help the UK improve on its current adaptation strategy.

¹ <https://www.ciwem.org/news/nap-3>

² <https://www.sciencemediacentre.org/expert-reaction-to-governments-climate-change-impacts-adaptation-plan-nap3/>

³ <https://www.theccc.org.uk/wp-content/uploads/2021/07/Independent-Assessment-of-UK-Climate-Risk-Advice-to-Govt-for-CCRA3-CCC.pdf>

Summary of the research gaps identified

Data, Metrics, Indicators, and Measurement

Effective climate adaptation in the UK is hampered by inconsistent data and metrics, making it difficult to measure progress and evaluate interventions. The workshops underscored the need for standardised, accessible data to enable the scaling of successful initiatives and the development of a coherent, evidence-based adaptation strategy.

Research questions:

- What data and information are essential for benchmarking and measuring progress in climate adaptation and what would constitute a robust set of measurable indicators for climate adaptation?
- What frameworks or guidelines are needed to effectively utilise data and analyse these indicators?
- What data is required to measure and evaluate the effectiveness of adaptation interventions, and what existing data (e.g., GIS, socio-economic factors) can be leveraged?
- How can the benefits of adaptation action, including non-financial ones such as avoided health impacts, be assessed?
- How can AI assist in managing, disaggregating, or interrogating data?
- How can citizen science complement aggregate data to reveal specific local contexts?
- How can new data on climate vulnerabilities be generated and collated, ensuring granularity while protecting privacy? What vulnerabilities might qualitative data reveal that quantitative data misses?
- How could system resilience (for example, the water system) be defined in the UK?

Interlinkages Between Sectors, Systems Thinking, and Quantifying Co-Benefits

Participants highlighted the importance of this theme due to the cross-sectoral nature of climate adaptation, where measures like blue and green infrastructure can simultaneously address issues like flooding, public health, and biodiversity. Current methods often fail to capture these interconnected benefits, highlighting the need for systems thinking to fully leverage the impacts for more effective adaptation strategies.

Research questions:

- How can systems thinking enhance understanding of interdependencies, co-benefits, and unintended consequences of adaptation measures, and how effective are these approaches in the decision-making process?

- How can co-benefits of climate adaptation actions be quantified and integrated into decision-making, and what are the most effective strategies for financing their delivery?

Understanding and scaling-up ‘what works’

To ensure effective adaptation, participants felt it was essential to quickly evaluate and scale successful interventions. Rapid assessment enables timely adjustments and broader implementation, maximising the impact of proven solutions. There is also a need to understand contextual factors and the extent to which they affect effectiveness (since ‘what works’ in one context may not always work in a different setting).

Research questions:

- What successful climate adaptation approaches from other countries can be adapted to the UK context, and how effective have existing programmes been in achieving intended outcomes and value for money?
- How effective are various interventions, such as cooling and flood resilience measures, across different building types, tenures, households, and geographical locations?
- What barriers exist to scaling up small-scale pilot studies to full-scale interventions, and how can this scaling-up process be better facilitated?

Unintended consequences and unequal impacts

Participants felt it was important to ensure adaptation efforts are equitable. There were concerns that certain measures might not be affordable for all, or that certain decisions might be made without consulting all those who might be impacted. Research therefore had a role to play in ensuring that decisions and interventions incorporate a broad range of voices and stakeholders into their design.

Research questions:

- What are the likely distributional outcomes of climate adaptation interventions?
- Who is currently missing from adaptation discussions, and how can these missing voices be included?
- How do current retrofit programmes affect experience of heat? What are the synergies and trade-offs between measures to heat homes in winter vs. cool them in summer? What is the relationship between thermal comfort and health, and when do these objectives conflict?

Behavioural insights

Participants highlighted that understanding current public knowledge, behaviour patterns and barriers to resilience were key to designing targeted, effective interventions that improve acceptance and address diverse needs.

Research questions:

- What are the current levels of knowledge and behaviours related to climate impacts and adoption of adaptation measures among the population?
- What barriers exist to adopting behaviours that increase resilience to climate change impacts, and how do these barriers vary across different demographics?

Awareness raising, public engagement and trust

There was consensus across the workshops that building trust through transparent communication and involving the public in decision-making processes would ensure that adaptation measures are better accepted and more impactful.

Research questions:

- How can key information and data on climate change impacts be most effectively shared with the public?
- What forms of public engagement are most impactful for different audiences (e.g., based on age, gender, ethnicity, affluence), and how do these engagements influence values, beliefs, and behaviours? Who are the most trusted messengers for communicating risks with the public?

Governance and Partnership Working

Effective governance is vital for successful climate adaptation, as it addresses split incentives, unclear responsibilities, and coordination challenges. Participants argued that further research is needed to develop frameworks that integrate efforts across sectors, align policies, and enhance stakeholder collaboration. Identifying and addressing these governance gaps will improve the efficiency and impact of adaptation strategies.

Research questions:

- What governance structures are needed to facilitate cross-departmental collaboration in Government for climate adaptation?
- Does Treasury Green Book guidance adequately capture the benefits of adaptation interventions, and what should be revised to improve it? What is the counterfactual when considering a wide set of impacts such as jobs, local economy, and health?

- What is the best approach for multi-level governance between the UK government, devolved administrations, and local authorities, including decision-making levels, economic incentives, and cross-budgeting implementation?
- What tools can improve collaborative decision-making, such as virtual decision rooms, and what are the best practices for building trust among adaptation partners?

Finance

Adapting to climate change involves significant financial costs. Identifying and exploring financing strategies will be crucial for effectively supporting and implementing adaptation measures.

Research questions:

- What level of investment is required to adapt to climate change, and what funding sources are available?
- How can public finance be used most effectively to deliver adaptation measures, including leveraging private sector investment and addressing funding deployment issues to avoid siloed-thinking and inefficient contracting?

About the workshops

The workshops brought together around 30-40 experts within each field (health, water, buildings), from across academic, practitioners, government and civil society. Participants were put into small groups in order to collectively identify research gaps. The discussions were broadly structured into two parts. First, participants took part in a “visioning” exercise, describing their ideal future for adaptation policy and outlining key outcomes that this policy would achieve. Next, the groups undertook a back-casting exercise, working backwards from this ideal future and identifying necessary steps and actions for the successful delivery of this outcome. Once necessary steps and changes were identified, the groups pinpointed critical research gaps which could help deliver these changes.

The workshops also featured thought-provoking talks from experts to stimulate group discussions. We were delighted to hear from the following speakers at each workshop:

- Health: Prof. Neil Ferguson (Imperial College London), Dr. Alice Bell (Wellcome Trust), and Jessica Newberry Le Vay (Imperial College London).
- Water: Dr. Ana Mijic (Imperial College London), Jonathan Kassian (Flood Re), and Alastair Chisholm (CIWEM).
- Buildings: Dr. Macarena Cárdenas (UK Green Building Council), Dr. Kate Simpson (Imperial College London), and Becci Taylor (Arup).

We extend our sincere gratitude to all participants and speakers for their invaluable contributions and collaborative spirit, which were invaluable in identifying these critical research gaps.

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