

Royal Society submission to the Environmental Audit Committee's inquiry on '*Climate Change Adaptation*'

1. The Royal Society welcomes the opportunity to respond to the UK Environmental Audit Committee's Inquiry on '*Climate Change Adaptation*'.
2. The work of the Royal Society includes a wide range of issues related to climate change. In February 2014 the Society and the US National Academy of Sciences jointly released *Climate Change: Evidence and Causes*¹. The publication was offered as a key reference document for individuals seeking authoritative information about the current state of climate change science. This publication followed the Royal Society report *Climate change: A summary of the science*² produced in 2010. Royal Society reports and statements have also been produced on such related issues as integrated assessment modelling³, geoengineering the climate⁴, energy technologies for a low carbon future⁵, governance of research into solar radiation management⁶, ground-level ozone⁷ and ocean acidification⁸.
3. The Royal Society is the National Academy of Science in the UK. It is a self-governing Fellowship of many of the world's most distinguished scientists. The Royal Society draws on the expertise of the Fellowship to provide independent and authoritative scientific advice to UK, European and international decision makers.
4. The Society is currently preparing a report on human resilience to extreme weather, chaired by Professor Georgina Mace FRS. The project aims to inform decisions regarding risk reduction and adaptation that are being made at global, national and local levels.
5. The report will give an overview of how risks related to extreme events may change in the future taking into account the multiple stressors, including demographic change and climate change. It will cover the fundamental elements of building resilience and evaluate specific options to increase resilience to floods, droughts and heat waves. The report is due to be published in December 2014 and will be available here: <https://royalsociety.org/policy/projects/resilience-climate-change/>.
6. This submission sets out various observations in response to the two questions most related to the Society's forthcoming report.
7. In the short term (10 to 20 years), the main driver of projected escalating event impacts is the increase in exposure, and very often of vulnerability, of people to extreme weather. In the long

¹ <https://royalsociety.org/policy/projects/climate-evidence-causes/>

² <https://royalsociety.org/policy/publications/2010/climate-change-summary-science/>

³ <https://royalsociety.org/policy/publications/2013/modeling-earths-future/>

⁴ <https://royalsociety.org/policy/publications/2009/geoengineering-climate/>

⁵ <https://royalsociety.org/policy/publications/2009/joint-academies-climate-change/>

⁶ <https://royalsociety.org/policy/projects/solar-radiation-governance/>

⁷ <https://royalsociety.org/policy/publications/2008/ground-level-ozone/>

⁸ <https://royalsociety.org/policy/publications/2005/ocean-acidification/>

term, climate change will alter the frequency, intensity and geography of extreme weather, amplifying human exposure and creating more uncertainty regarding events. Adaptation to climate change and resilience to extreme events are priorities to address the rising social and economic costs of these events. Furthermore, it is essential to reduce greenhouse gas emissions to lessen long term risks and reduce the risk of encountering physical limits to adaptation.

8. The UK currently faces a range of risks that will be exacerbated by climate change and increasing exposure. These include wind storms, flooding, storm surges, sea level rise and heat waves.
9. Adaptive management, a process of iteratively planning, implementing, and modifying strategies for managing resources in the face of uncertainty and change, is a key resilience technique. The UK's legal framework for adaptation to climate change recognises the importance of acting now through proactive planning and capacity-building, despite the uncertainties in climate projections. The UK government should continue to build a flexible, evaluative process, and implement evidence-based policies and anticipatory investment to reduce risks. Enabling and empowering local communities and private institutions to participate and contribute is a key element of a national strategy. By incorporating adaptability into the process uncertainty can be better managed.

Recommendations made by the Adaptation Sub-Committee's Report

10. The global scope of The Royal Society's resilience project means that we have not gathered evidence to allow us to comment on the detail of the recommendations in the latest progress report from the Adaptation Sub-Committee or the actions in the National Adaptation Plan. However, our work to date suggests that the Adaptation Sub-Committee's Report's broad conclusions are in line with the evidence. For example, the report concluded that:
 - a. ongoing development in flood risk areas is increasing reliance on flood defences, storing up risks and increasing future costs. This concurs with our emerging finding that increases in exposure of people and assets to hazards will result in growing impacts of extreme weather regardless of climate change.
 - b. more businesses need to recognise and act upon these risks. Our work suggests that greater efforts must be taken to ensure investment decisions are informed by evidence regarding the exposure of assets to risks from extreme weather.
 - c. better heat reduction measures need to be incorporated into the design of new buildings and retrofitted to existing buildings. Evidence we have gathered shows that it is vital to act now and take preventative action that establishes a resilient development trajectory rather than increasing human vulnerability by failing to make the necessary changes now.
11. Evidence is vital in developing effective policies for adapting to climate change and improving resilience to extreme weather. Careful scientific study, modelling, and monitoring can improve understanding of hazards and exposure, and can often provide valuable early warning. Our work suggests that further evidence and research is needed to improve our ability to model current risks and climate change impacts at appropriate scales for decision-makers, particularly at regional and local scales. Improved monitoring and evaluation of adaptation interventions are necessary to allow options to be assessed consistently to support better decision-making.

National, devolved and local delivery of adaptation objectives and accountability

12. National governments have primary responsibility and accountability for protecting their populations and enabling resilience building. They should achieve this in collaboration with other sectors and by enabling regional and local action. National governments should lead strategic oversight and planning. They should empower, coordinate and provide resources for complementary sub-national adaptation responses. Since adaptation is context-specific, local or regional innovations and solutions must be facilitated and community participation encouraged to bring together the users and producers of knowledge. Initiatives at all scales, from national to local, should be interdisciplinary however a clear institutional lead is required.

13. The UK must prioritise adaptive management, appropriate divisions of responsibility and better scientific study to reduce risk and build resilience to extreme weather events, now and in the future.

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