

UK Climate Services

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Foreword



“Climate change is not just the biggest challenge of our time - it is the biggest challenge of all time. But great challenges also present great opportunities.”

If we are to keep risks from climate change to a manageable level, the world needs to undertake rapid and sustained reductions in greenhouse gas emissions.

The world is already being increasingly exposed to climate change impacts leading to human suffering and economic instabilities. With the right information and expertise countries can adapt to minimise adverse effects and they can mitigate by moving to a lower carbon economy.

The United Kingdom can offer some of the best expertise in the world to countries wishing to reduce their exposure to catastrophic climate risks. From the Met Office’s internationally leading global meteorological analysis, to Kew Garden’s extensive botanical capabilities, the UK is rightly seen as a world leader in this field. Increasingly, the UK is expanding its provision of these services via projects across the globe

Sir David King

UK Special Representative
for Climate Change

Introduction

Climate variability and change are posing significant challenges in many countries. Effective action on climate change requires the right information and expertise to understand and find solutions to the problem.

This booklet provides a short introduction to the wide range of work that UK public sector organisations are providing on climate services around the world, and provides contact information for these providers. The following pages will showcase several examples of UK activities in this growing field of 'climate services'.

Climate services range from hurricane warning and response systems, to pioneering agricultural techniques, to flood resistant infrastructure planning, to supply chain resilience analysis. Climate services bring relevant data and information together to support adaptation and mitigation programmes, and to assist with climate risk management at all levels.

Climate services involve strong partnerships between information providers and information users, such as Government agencies, for the purposes of interpreting and applying information for decision making, planning, sustainable development, prediction and outlook.

Interest in climate services is gaining a greater focus around the world, driven by the growing awareness of our vulnerability to extreme weather events and the need to cope with current and future impacts of climate change. Many British companies also provide a variety of climate services. Local UK Trade and Industry (UKTI) offices can assist with contacts.

Climate Services in the UK

Success in climate services is a combination of having the right information and being able to interpret it effectively to generate valuable guidance. The UK has world leading scientific, technical and policy expertise on climate change adaptation and mitigation.

Climate data and information services are an integral part of the UK's National Adaptation Programme¹ (NAP) which provides a framework to manage the risks and opportunities posed by a changing climate. A foundation of adaptation planning is the **UK Climate Projections**² - a tool that allows users to look at plausible changes for the UK's climate in the 21st century. This is delivered by several organisations alongside the Department of Energy and Climate Change (DECC) and the Department for Environment, Food & Rural Affairs (Defra).

The UK also has considerable expertise in agricultural technology, and has a number of world-leading institutes like the John Innes Centre and East Malling Research, contributing to work to ensure that agriculture can adapt to climate change.

Adaptation is not only within the realm of government. Businesses need to adapt too. In an expanding global market for climate-related products, UK companies are playing a strong role. A recent UK Government report⁴ on climate change opportunities showcased examples of UK companies that are addressing climate impacts with specialist products and services.



Climate Impact Planning: The **Met Office Hadley Centre** works closely with infrastructure providers to understand and plan for climate change variability and impacts. The UK energy sector has developed practical applications and business strategies by predicting future demand, while the rail network plans for the future by analysing which parts of the rail service are most vulnerable to climate impacts.

Atmospheric Data Analysis: The **British Atmospheric Data Centre** (BADC) can help businesses, entrepreneurs and innovators create 'bridging' tools, such as software. These bridge the gap between datasets, which BADC hold, and front line decision-making products. The BADC is the **Natural Environment Research Council** (NERC)'s data centre for atmospheric sciences. It helps researchers locate, access, and interpret atmospheric data. BADC is also the UK node for the **Earth System Grid Federation** - the repository for the world's leading research and modelling on global climate change.

UK universities have a strong track record providing environmental services and this is expanding overseas. For example, a range of universities are a part of the **Adaptation and Resilience in the Context of Change Network**⁴ which supports capacity building, awareness raising and informs new approaches to identify, assess and address climate risk from evolving science and research.

Waterway Management Planning: The **Environment Agency** produced Thames Estuary 2100, a management plan for the River Thames, by developing a 'Flexible Adaptation Pathways' methodology. This work a critical part of the Thames Estuary's



The Met Office Hadley Centre has worked closely with UK infrastructure providers to understand and plan for the impacts of climate variability and change.

long term flood investment strategy. The pathways approach has since been used in the USA, the Netherlands, Australia and New Zealand, and ensures flood risk management plans are adapted to cope with extreme climate impacts.

Infrastructure Resilience Planning: Since 2009, under the Adaptation Reporting Power (ARP)⁵, Defra and the **Environment Agency** have been working with over 100 UK infrastructure businesses and public bodies to help them identify their vulnerabilities to extreme weather and develop action plans to increase their resilience. The ARP directly feeds into the NAP, and ensures that key threats to business and industry are recognised within it.

1 www.gov.uk/government/publications/adapting-to-climate-change-national-adaptation-programme

2 <http://ukclimateprojections.metoffice.gov.uk>

3 www.acclimatise.uk.com/network/article/acclimatise-authors-an-important-new-report-on-uk-private-sector-resilience-and-market-opportunities-for-climate-products-and-services

4 www.arcc-network.org.uk

5 www.gov.uk/government/publications/adapting-to-climate-change-2013-strategy-for-exercising-the-adaptation-reporting-power

Climate Services and Development



It is the poorest people in developing countries who are most vulnerable to climate change, and they have the least ability to adapt and respond to their changing environment. In Sub-Saharan Africa alone, at least 11.5 million people per year are affected by extreme weather.

Better climate information helps prevent humanitarian disasters and economic setbacks that can be the result of a changing climate. Climate information plays a crucial role in national development planning, allowing governments to manage development opportunities and climate risks. The UK supports development through climate services via a large range of projects,

many of them financed through programmes such as the Foreign and Commonwealth Office's (FCO) **Prosperity Fund**⁶, the Department for Business, Innovation and Skills' (BIS) **Newton Fund**⁷. The UK has recently signed two major agreements with the USA to enhance climate resilient development around the world.



Data compiled by the University of Reading's TAMSAT programme has been used to provide affordable insurance to farmers in Zambia

Africa: The Met Office Hadley Centre, through the Department for International Development (DfID) Climate Science Research Partnership, worked with African climate organisations to create much-needed new forecast products, which revealed the underlying causes of African climate variability and change. Working systems were developed for climate monitoring and attribution of extreme weather events. Support was provided for the development and use of climate science in Africa.

East Africa: The Weather and climate Information SERVICES for Africa (WISER) programme is the first phase of a pan-African programme, focusing in six countries in East Africa. DfID will fund £35m over 4 years bolstering the resilience of African people, and spurring economic development, in the face of weather-related shocks. The programme is a pillar of the US-UK collaborative agreement on climate services,

and will modernise national meteorological services to generate better data and improve services for fisher and farmer communities. It will also strengthen regional strategies on weather data, enhance the reliability of forecasts, and develop successful existing mechanisms like the Severe Weather Forecasting project on Lake Victoria.

Zambia: Data collected by satellite and compiled by the University of Reading's TAMSAT programme⁸ has been used to provide affordable insurance to farmers in Africa. NERC funding then helped develop weather index insurance products that will benefit thousands of Sub-Saharan African farmers. In Zambia, the weather index insurance cover insured 7000 farmers against severe drought or excess rain, leading to pay-outs being made following drought or excess rainfall amounting to over \$40,000 and benefitting 3,700 farmers.

6 www.gov.uk/prosperity-fund-programme

7 www.newtonfund.ac.uk

8 www.met.reading.ac.uk/tamsat



The Royal Botanic Gardens, Kew aims to provide a climate resilient coffee economy strategy for Ethiopia

Niger: NERC funding has helped the **University of Reading** develop the Africa Climate Exchange Project, which disseminates weather information throughout local communities. In Niger this has developed the Rainwatch monitoring system, providing critical life-or-death information on weather variation. This provides a transferable platform that delivers users analysis of seasonal rainfall dynamics.

Ethiopia: A significant proportion of the Ethiopian population depends on coffee for its livelihood. In partnership with local scientists and stakeholders, the **Royal Botanic Gardens, Kew** aims to provide a climate resilient coffee economy strategy for Ethiopia through a DfID funded programme. Following rigorous research into the influence of climate change on wild coffee forests and coffee producing areas, the strategy will provide a scientific foundation for policy decisions that will bolster the Ethiopian coffee industry against the threat of climate change. This work is already guiding policy and

helping to focus on-the-ground interventions for vulnerable coffee farming communities.

Brazil: **Natural England** have assisted the Brazilian government to develop a Climate Change Impacts Monitoring System. The system pinpoints climate change impacts, collates the complex datasets, and can then feed the resulting analysis to policy makers. The UK is a world leader in this area, and works to develop similar systems across the globe.

Bangladesh: The **Met Office Hadley Centre** has trained local scientists in using PRECIS (Providing Regional Climates for Impact Studies), a regional climate modelling system that can be used anywhere in the world. Using PRECIS through a DfID funded programme, Bangladesh is producing high-resolution regional climate projections and detailed regional climate information. This capability gives policymakers the information they need to make effective plans combating climate change.

China: The Climate Science for Service Partnership China between the **Met Office Hadley Centre** and Chinese institutes, such as the Chinese Meteorological Administration, works to develop climate services that support economic development and social welfare. The partnership draws on shared expertise to develop the cutting-edge science needed to support climate-smart decision making, helping authorities to navigate the challenges of a changing climate that impact the resilience of local populations. This project is part of the Newton Fund, the UK's bilateral international science and innovation fund that promotes economic development and social welfare in 15 countries.

East Malling Research have set up the Sino UK Sichuan Agriculture Centre with Sichuan Provincial Agriculture and Forestry Institute and China Technology Exchange. The centre takes the form of a registered company worth £1m, and aims to develop strawberry varieties for the Chinese market, as well as introducing more efficient irrigation methods and developing treatments for strawberry root virus. The relationship was initiated through a technology partnering workshop run by the FCO's Science & Innovation Network.

Singapore: Another example of international partnership is the **Met Office Hadley Centre** and the Meteorological Service Singapore (MSS) are collaborating to enhance Singapore's climate science capability. The three year programme features an exchange of scientists and expertise, enhancing research in regional climate science and developing climate models. During these exchanges, Met Office Hadley Centre scientists benefit from a greater understanding of climate impacts in South East Asia and MSS staff gain knowledge about UK climate modelling and climate science. The programme will enhance decision makers' capabilities as they assess risks faced by the country and the wider South East Asia region



The Met Office Hadley Centre and Chinese institutes works to develop climate services that support economic development and social welfare

Public-Private Partnership on Climate Data and Information for Resilient Development (PCDIRD)

An agreement has been signed by the UK and the US Governments to create a public-private partnership on climate data and information. This partnership will help developing countries to adapt to the impacts of climate change.

The US/UK Collaborative Arrangement on Climate Data and Services for Resilience

A bilateral agreement between the US and UK Governments to provide climate data, products, and services to support resilience and climate-smart development in developing countries. The agreement builds upon many years of close collaboration between the US and UK governments and will identify effective means of enhancing cooperation across the US and UK developmental portfolios. It also plans to create a replicable model for using climate data and information for resilient development.

Information on Organisations

Government Networks

UK Science & Innovation Network

A jointly funded network by BIS & the FCO in 28 countries and 47 cities around the world. They create important relationships to best use the value of science and innovation discoveries and investments overseas.

www.gov.uk/government/world/organisations/uk-science-and-innovation-network

UK Trade and Investment

UKTI works with UK based businesses to ensure their success in international markets through exports.

www.gov.uk/government/organisations/uk-trade-investment
enquiries@ukti.gsi.gov.uk

Natural Environment Government Agencies

The Environment Agency

Works to create better places for people and wildlife, and support sustainable development. Their Climate Ready Support Service provides tools, information and practical advice to help businesses and other organisations live with the changing climate, now and in the future.

www.gov.uk/government/organisations/environment-agency
enquiries@environment-agency.gov.uk

Natural England

The government's adviser for the natural environment in England, helping to protect England's nature and landscapes for people to enjoy and for the services they provide. An executive non-departmental public body, sponsored by Defra.

<https://www.gov.uk/government/organisations/natural-england>
enquiries@naturalengland.org.uk

Climate Related Science

Met Office Hadley Centre

Providing world-leading climate science guidance on to support decisions to keep people safe, well and prosperous, enhanced by close working relationships with partner organisations around the globe. DECC and Defra co-fund the Met Office Hadley Centre Climate Programme.

www.metoffice.gov.uk

enquiries@metoffice.gov.uk

Natural Environment Research Council

NERC is the leading public funder of environmental science in the UK. They have a wide range of climate services capabilities, and hold large volumes of environmental data which is freely available to businesses and policy makers.

www.nerc.ac.uk

Royal Botanic Gardens, Kew

Founded in 1759, Kew's science and conservation work helps to discover and describe the world's plant and fungal diversity, safeguards the world's plant life for our future and promotes the sustainable use of plants.

<http://www.kew.org>

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