K4D | Knowledge, evidence and learning for development

Development, Climate and Environment: An Annotated Bibliography

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Question

DFID would like a K4D HD enquiry to pull together into an HD report (annotated bibliography) with links, with a variety of material:

- *Inter-disciplinary or multi-disciplinary in nature;*
- *Could be books, academic papers, webinars, podcasts, Ted Talks, radio programmes, or TV programme etc.;*
- *Could be fun/captivating/thought-provoking/serious/essential reading;*
- *We are asking fellow HoPs to suggest items.*
- *Please make sure you have at least one from each cadre's perspective looking at environment and climate.*

Contents

1. Summary

Climate and the environment affect us all, as do any changes to them. Therefore, it is important to understand the basics on the causes of these changes, as well as how these changes affect people and the potential impacts, and how people are and can deal with these impacts. This reading list summarises topics of interest for all 13 cadres of DFID related to climate and the environment. Its purpose is to feed into the new K4D-DFID Learning Journey on Environment and Climate, and to support DFID in promoting seminars, workshops, and events over the coming months.

The information on climate change and resilience included in this helpdesk report are taken from a variety of global sources, which were developed or designed for a range of audiences: young and old, academic and layperson, governments and the general public – or a combination of these. An assortment of peer-reviewed research and graphic/visual evidence is supplied, some recommended by HOPs themselves. Of the thousands of official talks on TED.com, there are 1,149 results tagged with the word "*climate*".[1] Therefore, a select few of these videos are included for informative purposes. Online, local/country-based and international tools for monitoring and evaluation currently available for use are also highlighted. A section on gender also included, as it is a key issue that women will be more adversely affected by changes in climate and natural resources. Finally, a choice of potential solutions to dealing with various climate and environmental issues (as well as possible barriers to bear in mind), are listed, with supportive evidence.

2. Climate and environment: the facts for various audiences

Government

Speech: Secretary of State on climate resilience

Stewart, R. (July 2019). https://www.youtube.com/watch?v=PSOIs2_ij84&feature=youtu.be

The Secretary of State for DFID, Rory Stewart, delivered a speech on climate resilience at the Royal Institution on 3 July 2019. DFID's Communication Division published the speech on gov.uk. Stewart declares that every single UK aid programme must be assessed on its ability to limit climate change and protect the environment: "questions of power, distribution of resources, communities, are at the very centre of success and failure in the area of climate and the environment, as much as it is at the centre of any other area of development." Over £190 million is now available for a new research series of DFID initiatives related to climate and environment - in particular, on resilience in the developing world. However, this is "barely one three hundredth" of the amount needed to solve global poverty. Together with major donors such as the United States, Germany, and others, this is still only scratching the surface.

Videos: Unpacking International Climate Governance. 15 minutes each

IISD Reporting Services (2015). Paris Knowledge Bridge – 4 videos. http://enb.iisd.org/paris-knowledge-bridge/video-2-the-pillars-of-climate-governance/

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[1] https://www.linkedin.com/pulse/top-20-ted-talks-climate-change-ranked-ibm-watson-jeremy-waite (2019)

The Paris Agreement[2] was successfully agreed to by 195 states in 2015 to guide the future of climate governance and country actions to deal with the impacts and causes. These four videos are an introduction to the history, issues, actors, and dynamics in global climate governance. They can be watched in any order to learn more about how the world addresses climate change.

Documentaries: Al Gore's An Inconvenient Truth – available to stream on Amazon Prime

1. Gore, A. (May 2006). An Inconvenient Truth (2006). Official trailer: 3 minutes
   https://www.youtube.com/watch?v=Bu6SE5TYrCM

Former US presidential candidate Al Gore campaigns to raise public awareness of the dangers of global warming, calling for immediate action to curb its destructive effects on the environment. A selection of presentation slides featured in the film can also be found here.

2. Gore, A. (July 2017). An Inconvenient Sequel: Truth to Power. Official trailer: 3 minutes
   https://www.youtube.com/watch?v=huX1bmfdkyA

This is an update on Gore's campaign to raise awareness and influence policy. It addresses the progress made to tackle the problem, and Gore's global efforts to persuade governmental leaders to invest in renewable energy, culminating in the landmark signing of 2015's Paris Agreement.

Other voices

Apart from governments, other groups also need to be aware of the facts and how it effects their lives:

Video: Climate Change – The Facts

BBC (April 2019). Official trailer: 4 minutes. https://www.bbc.co.uk/programmes/p076w7g5

In this summary of the one-hour documentary "Climate Change - The Facts," Sir David Attenborough outlines the challenge it poses for all of us. As one climate change expert interviewee states: "if the poor are suffering today, the rich will also suffer tomorrow."

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[2] The Paris Agreement is an agreement within the United Nations Framework Convention on Climate Change (UNFCCC), dealing with greenhouse-gas-emissions mitigation, adaptation to climate change impacts, and finance, signed in 2015. The central aim is to strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5°C.

Article: What is Climate Change? Everything You Need to Know About Global Warming

Hernandez, E. (July 2018). https://www.teenvogue.com/story/climate-change-explained-global-warming

TeenVogue is "the young person's guide to conquering (and saving) the world." This article is aimed at informing teenagers about climate change.

Documentary: The Age of Stupid

1. BBC (April 2009). Official trailer: 2 minutes **https://www.youtube.com/watch?v=mfr-F_18sOk (full documentary available on Amazon Prime)**

Set in an unspecified future, an archivist looks back at footage from 2008 and tries to understand why humankind failed to address climate change. The film is a drama-documentary-animation hybrid, containing environmental activists, as well as exploring (provocative) opinions and ideas. An offshoot of *The Age of Stupid* project is 10:10, a UK-wide campaign encouraging everyone in the country to reduce their carbon emissions by at least 10% in 12 months in 2010. Since then, several hubs across the world have continued to campaign in reducing carbon emissions in various guises.

2. Guardian (March 2019). The Age of Stupid revisited: what's changed on climate change? –10 minutes. https://www.youtube.com/watch?v=GqHKYwxEIRA

The Age of Stupid was revisited ten years later in 2019 in a video for the Guardian newspaper, which follows its director as she revisits people and places from the film and asks: are we still heading for the catastrophic future it depicted? It also touches on the recent School strikes for climate and Extinction Rebellion protests.

Video: Interview- Why are some countries more vulnerable to climate change?

International Alert (2014). 5 minutes. https://www.international-alert.org/media/interview-why-are-some-countries-more-vulnerable-climate-change

Janani Vivekananda, Climate Change, Environment and Security Manager at the non-governmental organisation (NGO) International Alert, provides insights on the complex links between climate change and conflict, and identifies five key narratives on how to address corresponding challenges.

3. The evidence on climate change causes

The climate varies naturally, but there is a strong scientific consensus that recent climate change has been caused by manmade greenhouse gases.[3] Climate change and its effects are complex

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[3] The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change. The IPCC has published five comprehensive assessment reports reviewing the latest climate science (the most recent was AR5 in 2014), as well as a number of special reports on specific topics. A key recent special report on *Global Warming of 1.5°C (SR15)* was released in October 2018, and summarises the findings of scientists on maintaining a temperature rise to below 1.5°C, which remains possible, but only

and multifaceted, and there are still many unknowns and much uncertainty on the potential impacts of climate change and its timescales. Furthermore, despite the scientific consensus and mainstream acceptance of the manmade causes of climate change, not everyone shares the same views regarding causes of these changes. The following resources provide some background information on the causes of climate change and its impacts, and some insights into why people continue to have different beliefs in the causes of climate change despite the scientific consensus.

Public-private opinions

Videos:

1. National Geographic (n/d). Causes and effects of climate change. 3 minutes.
    https://video.nationalgeographic.com/video/101-videos/climate-101-causes-and-effects

What causes climate change (also known as global warming)? And what are the effects of climate change? This video from the flagship channel's 101 series allows viewers to learn the human impact and consequences of climate change for the environment, and our lives.

2. Climate-KIC (November 2015). Climate change explained in under 2 minutes.
    https://www.youtube.com/watch?v=-n4A0BssFd0

Climate-KIC is Europe's largest public-private innovation partnership focused on climate innovation to mitigate and adapt to climate change. This video, funded by European Institute of Innovation and Technology (EIT), explains how greenhouse gases have influenced climate change since the industrial revolution in the 1700s, and how innovation is needed to bring down GHG levels today.

Education and perceptions

TED talk: 3 kinds of bias that shape your worldview

Shepherd, J.M. (March 2018). 12 minutes.
https://www.ted.com/talks/j_marshall_shepherd_3_kinds_bias_that_shape_your_worldview?language=en

Meteorologist Professor J. Marshall Shepherd explains how belief systems (cognitive dissonance) and biases (e.g. confirmation, and cognitive [i.e. the Dunning-Kruger effect]) impact perceptions on climate change. He also discusses available literacy and misinformation, knowledge on technology, as well as ideas for "expanding our own radius in understanding science."

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through "rapid and far-reaching transitions in energy, land, urban and infrastructure..., and industrial systems" (https://www.ipcc.ch/sr15/).

Testing contrarian research on climate change causes

Paper: Learning from mistakes in climate research

Benestad, R.E., Nuccitelli, D., Lewandowsky, S., Hayhoe, K., Hygen, H.O., van Dorland, R., & Cook, J. (August 2015). *Theoretical and Applied Climatology,* 126: 699. https://doi.org/10.1007/s00704-015-1597-5

What is happening with the 2% of papers that reject anthropogenic global warming (AGW)? This paper examined a selection of such contrarian climate science research papers. An analytical tool using R programming language was developed to replicate and test the results and methods used in these studies. A warning on what happens when you try to replicate climate contrarian papers is listed in this article here.

4. Monitoring and evaluating climate change

There are several tools used for monitoring changes in climate and environment in different settings. Data is also available evaluating how climate has changed over different centuries:

Monitoring

UK

Tool: WWF carbon footprint calculator

WWF (n/d). https://footprint.wwf.org.uk/?pc=ATC001002&gclsrc=aw.ds&ds_rl=1263542&ds_rl=1263542&gclid=EAIaIQobChMI-fbRjNen4wIVguFRCh04SQULEAAYASAAEgI_Z_D_BwE&gclsrc=aw.ds#/

The WorldWide Fund for Nature (WWF) calculator shows British audiences how their current lifestyle is affecting the environment, measured against the 2020 target as set by the UK government. Local calculators for nine other countries are also available.

Report: 4th annual State of the UK Climate report

Met Office (July 2017). https://www.metoffice.gov.uk/research/climate/maps-and-data/about/state-of-climate

For the first time this latest report is being published as a special issue of the International Journal of Climatology, which is the Royal Meteorological Society Journal of Climate Science. A useful infographic highlights UK indicators of climate change and variability, such as more named storms and daily weather extremes. A supplementary report from November 2018 looking at various indices of climate extremes is also now available here.

The Met Office also recently released the UK Climate Projections 2018 (UKCP18), which provides a major upgrade to the range of UK climate projection tools designed to help decision-makers assess their risk exposure to climate. UKCP18 uses cutting-edge climate science to provide updated observations and climate change projections out to 2100 in the UK and globally. A factsheet with key messages is available here.

Global

Website: Climate links

USAID (n.d.). https://www.climatelinks.org/

This is a Global Knowledge Portal for Climate and Development Practitioners. USAID is developing a variety of tools, checklists, and reference documents to assist agency staff and partners with effectively planning and managing performance monitoring. There is also an increasing focus on rigorous impact evaluations that can inform future program design.

Paper: A framework for assessing the accountability of local governance arrangements for adaptation to climate change

Mees, H., & Driessen, P. (February 2018). *Journal of Environmental Planning and Management,* 62(4), 671-691. https://doi.org/10.1080/09640568.2018.1428184

Accountability has hardly been studied in the governance of climate change adaptation. This paper develops a framework for assessing the accountability of interactive governance arrangements for local adaptation. The framework is based on five important accountability mechanisms. Application shows that the five proposed mechanisms and their operationalisations offer a valid assessment of the accountability of such arrangements.

Paper: Economic, social and governance adaptation readiness for mitigation of climate change vulnerability: Evidence from 192 countries

Sarkodie, S.A., & Strezov, V. (March 2019). *Science of the Total Environment*, 656, 150-164. https://www.sciencedirect.com/science/article/pii/S0048969718347053

Adaptation strategies have become critical in climate change mitigation and impact reduction, to safeguard population and the ecosystem from irreparable damage. While developed countries have integrated adaptation plans and policies into their developmental agenda, developing countries are facilitating or yet to initiate adaptation policies in their development. This study examines the nexus between climate change vulnerability and adaptation readiness in 192 UN countries using mapping and panel data models.

Paper: How integrated monitoring and evaluation systems can help countries address climate impacts

Brooks, N., Rai, N., & Anderson, S. (August 2018). IIED Briefing, 4 pages. https://pubs.iied.org/17470IIED/

Climate change impacts are already being felt around the world and they seriously threaten the achievement of the SDGs. With climate impacts playing out in endlessly varying combinations, policymakers need effective systems for learning what sort of adaptation works. This briefing by the independent policy research institute IIED (The International Institute for Environment and Development) shows how governments will need to think differently about how they monitor and evaluate (M&E) their adaptation initiatives if they want to keep sustainable development on track.

Paper: Assessing adaptation results: aligning national M&E systems and global results frameworks

Rai, N., Smith, B., & Brooks, N. (May 2019). Issue paper, 44 pages.
https://pubs.iied.org/10198IIED/

The Paris Agreement provides a foundation for the most robust climate change transparency system to date, requesting countries to provide information on their progress to adaptation targets. Linking up country-led and global M&E systems can be mutually beneficial. It would help streamline workflows and reduce reporting burdens, minimise resource wastage, and win 'buy-in' from the people responsible for making sure these systems work. This IIED paper looks at the M&E approaches of major climate funds and national frameworks to draw lessons for aligning country systems and fund-level results frameworks in order to assess adaptation success more effectively.

Paper: Climate and Environment monitoring for decision making

Ceccato, P., Fernandes, K., Ruiz, D., & Allis, E. (June 2014). *Earth Perspectives*, 1, 16.
https://doi.org/10.1186/2194-6434-1-16

The US market research company IRI conducts research to understand the impact of climate and environmental changes on different sectors. These include agriculture, water management, human health, and natural disasters. IRI focuses on monitoring satellite-derived and in-situ estimates of precipitation, temperature, vegetation, water bodies, evapotranspiration, and land cover. New products developed at IRI in partnership with other institutions at national (e.g. NOAA, NASA, USGS) and international (e.g. National Meteorology Agencies, UN FAO) levels are integrated into operational early-warning systems for health, natural disasters, agriculture, and food security. The new products which monitor in almost real-time climate and environmental conditions are made available through two online data bases at IRI called IRI Data Library and Map Room. This paper presents the products developed at IRI and how they are integrated into Early Warning Systems (EWS).

Tool: Ready to use climate change data

the climate data factory (n/d).
https://theclimatedatafactory.com/?gclid=Cj0KCQjwpPHoBRC3ARIsALfx-_I8B2bxiuvEC6M2_3yjHA9wX8ns0Mdd47NfbdSzlSCNAqRXSzT0OZ8aAoX8EALw_wcB

the climate data factory is an independent private climate service company based in Paris, France. It makes easy access climate model data fit for purpose for researchers and adaptation practitioners. This webtool allows ready to use climate change data to be downloaded at two scales: city or country. There are six essential climate variables: mean/minimum/maximum temperature, rainfall, wind speed, and solar radiation. A package of 30 climate indices are also designed for impact studies, including heat waves duration, heating degree days, or extremely wet days.

Evaluation

Infographic: Temperature Anomalies by Country Years 1880-2017

Lipponen, A. (2019). flic.kr/p/293M1oa or https://www.youtube.com/watch?v=PhbdyNnUIiM

This graphic by Antti Lipponen is based on National Aeronautics and Space Administration (NASA) Goddard Institute for Space Studies (GISS) Temperature Analysis (GISTEMP) data of 191 countries. It shows how temperature of the global surface swings above and below the average (0 to +/-2℃) over 137 years, with most of the warming taking place during the last 35 years. A colour-coded map by NASA in Robinson projection displaying progression of changing global surface temperature anomalies from 1880 to 2018 can also be found here. It shows that 2018 is the fourth warmest year in continuing warming trend.

Interactive data graphics: The impacts of climate change at 1.5C, 2C and beyond

CarbonBrief (October 2018). https://interactive.carbonbrief.org/impacts-climate-change-one-point-five-degrees-two-degrees/?utm_source=web&utm_campaign=Redirect

Carbon Brief is a UK-based website funded by the European Climate Foundation, covering the latest developments in climate science, climate policy and energy policy. Carbon Brief has extracted data from approximately 70 peer-reviewed climate studies to show how global warming is projected to affect the world and its regions. All research presented compare impacts at 1.5℃ and 2℃ of warming above pre-industrial levels- the Paris Agreement's temperature limits; if the research also includes a higher temperature level (e.g. 2.5℃, 3℃ or 4℃) this is also shown. The data presented can also be accessed in this spreadsheet. In 2019, Carbon Brief won the Association of British Science Writers' Award for "Innovation of the year" for this interactive feature.

5. Global effects/impacts of climate change

Already, climate change has had major impacts on different societies and areas of our lives:

Effect on conflict

Paper: Climate change and violent conflict: Sparse evidence from South Asia and South East Asia

Nordqvist, P., & Krampe, F. (September 2018). SIPRI Insights on Peace and Security. 2018/4. 12pp. https://www.sipri.org/sites/default/files/2018-09/sipriinsight1804.pdf

This Stockholm International Peace Research Institute (SIPRI) Insights paper explores and summarises the findings from a systematic literature review of climate–conflict research on South Asia and South East Asia. Although these regions have been greatly affected by both climate change and conflict, there have only been a small number of rigorous academic studies that focus on the climate–conflict relationship. It acknowledges that four mechanisms are often interlinked and their effect more noticeable (e.g. on livelihoods) in some climatic, conflict and socio-economic contexts than in others. A summary of the paper by the World Economic Forum,

explaining why we need to do more to understand how climate change and conflict are linked, can be found here.

SIPRI also host the *Expert Working Group on Climate-related Security Risks*, which seeks to highlight the gap in climate risk informed decision-making and strives to produce timely climate security assessments. Currently they have produced research on four geographies: Iraq, Lake Chad, Somalia and Central Asia, which can be found here.

Effects on economies

Paper: Global warming has increased global economic inequality

Diffenbaugh, N.S., & Burke, N. (May 2019). *PNAS*, 116 (20), 9808-9813.
https://www.pnas.org/content/116/20/9808

Economic inequality (the difference between the poorest countries and the richest countries) between countries has decreased over the past few decades. However, new research in the *Proceedings of the National Academy of Sciences* reveals that between 1961 and 2010, the country-to-country gap would have narrowed *more* if not for climate change.

Effect on gender

Website: Introduction to Gender and Climate Change

UNFCCC (n.d.). https://unfccc.int/gender

This UN climate change website makes the connection between and climate change and gender.

Article: Gender remains one of climate change's great inequalities

Lovin, I., & Bamsey, H. (August 2017). *Climate Home News.*
https://www.climatechangenews.com/2017/08/31/gender-remains-one-climate-changes-great-inequalities/

This opinion piece by independent news site *Climate Home News* reports why Sweden's deputy prime minister and the head of the Green Climate Fund say women have the right to – and need to – be at the forefront of efforts to deal with climate change.

Guidance: Roots for the Future - the Landscape and Way Forward on Gender and Climate Change

International Union for Conservation of Nature (IUCN) (May 2015). 465pp. ISBN 978-9968-938-70-9.
https://portals.iucn.org/library/sites/library/files/documents/2015-039.pdf

Roots for the Future presents the latest research, data, strategies, and results on gender and climate change policymaking and programming over the last decade. This publication was produced by the IUCN) Global Gender Office (GGO) under the auspices of the Global Gender and Climate Alliance (GGCA) joint programme, made possible by the generous support of the Government of Finland.

Campaign: Empowering women on the frontlines of climate change

UN Environment /UN Women/ UNDP (March 2019). https://www.unenvironment.org/news-and-stories/story/empowering-women-frontlines-climate-change

The UN Environment #SolveDifferent campaign focuses on "an informative and emotive approach to communicating the environmental cost of key consumption and production models". To help tackle the effects of climate change, the joint programme "Promoting Gender-Responsive Approaches to Natural Resource Management for Peace" implemented by UN Environment, UN Women and the United Nations Development Programme, has spent the last two years training women in farming, natural resource management and conflict resolution. The project in Sudan is the first under the joint programme. A 1 minute video on empowering women on the frontlines of climate change is also included.

Impacts on future livelihoods

Video: Dear Future President. Climate Change Is the REAL American Horror Story Nobody's Talking About

TeenVogue (November 2016). 3 minutes. https://video.teenvogue.com/watch/climate-change-is-the-real-american-horror-story-nobody-is-talking-about

This webisode is where a selection of US millennials and 'gen z'-ers voice their opinions to the future leader about what needs to be done about climate change. It includes solutions for environmental racism and improving race relations.

Video: Environment and Climate Change Overview

Irish Aid (n.d.). 3 minutes. https://www.irishaid.ie/what-we-do/our-priority-areas/environment-and-climate-change/environment-and-climate-change-overview/

The effects of climate change disproportionately affect women and girls. In particular, it affects rural women in developing countries, who are still largely responsible for securing food, water, and energy for cooking and heating. In this video, Irish Aid shows how it is supporting poor communities to adapt and to be better able to cope in the face of these challenges. This is in line with their commitment to Millennium Development Goal 7 to ensure environmental sustainability. It also takes into account health and nutrition, as well as gender and rights.

Impact on health

Paper: A Comparative Analysis of Climate-Risk and Extreme Event-Related Impacts on Well-Being and Health: Policy Implications

Filho, W.L., Al-Amin, A.Q., Nagy, G.J., et al. (February 2018). *International Journal of Environmental Research and Public Health*, 15(2), 331. https://doi.org/10.3390/ijerph15020331

There is a great variety of literature about the strong links between climate change and health, while there is relatively less literature that specifically examines the health impacts of climate risks and extreme events. This paper is an attempt to address this knowledge gap, by compiling eight examples from a set of industrialised and developing countries, where such interactions are

described. The policy implications of these phenomena and the lessons learned from the examples provided are summarised. Some suggestions as to how to avert the potential and real health impacts of climate risks are made, hence assisting efforts to adapt to a problem whose impacts affect millions of people around the world. All the examples studied show some degree of vulnerability to climate risks regardless of their socioeconomic status and need to increase resilience against extreme events.

Impact on agriculture and natural resources

Module: The Future of Farming

The University of Reading (n.d.). Future Learn. https://www.futurelearn.com/courses/climate-smart-agriculture/0/steps/26565

This free online module is from 'The Future of Farming: Exploring Climate Smart Agriculture.' It explains that the changing climate is having far reaching impacts on agricultural production, which are likely to challenge food security in the future.

Website: Natural resource management in a changing climate - land, forests, water and energy

ODI (n.d.). https://www.odi.org/natural-resource-management-changing-climate-land-forests-water-and-energy

The Overseas Development Institute (ODI) is an independent think tank. Its research on natural resource management in the context of climate change looks at two key areas: 1- land-based climate change mitigation activities, and 2- the effective use of natural resources for development purposes. Their latest reports and publications can be found in their Climate and energy programme.

Impact of UK governance

Video: UK aid and climate change

1. DFID (July 2019). What is climate resilience? 1 minute.
   https://twitter.com/DFID_UK/status/1146321426368159744
2. DFID (July 2019). How UK aid is preparing the world for climate change. 1 minute.
   https://twitter.com/DFID_UK/status/1146311765845774337

Two short videos show how the UN Sustainable Development Goal (SDG) 13 on Climate Action can be met: the first video explains climate resilience and how Britain is investing in this area; the second video is a case study from Niger showing the impact of a UK aid and World Bank programme helping farmers adapt to climate change.

Video: Lamu town in Kenya is a UNESCO World Heritage site that is under threat from climate change

DFID (July 2019). 1 minute. https://twitter.com/DFID_UK/status/1149266662232940545

Climate change is damaging its fragile ecosystem and the livelihoods of people in Lamu town, Kenya. The Secretary of State explains how UK aid is helping the town to develop in a sustainable way (addressing SDG 11: sustainable cities and communities).

6. Barriers and solutions

The literature is full of ideas on how to deal with climate change, however, practical evidence is sometimes lacking. The following is a selection of advice and promising options under eight headings to consider; first, possible barriers are also considered:

Barriers to response

Article: 'You Did Not Act in Time.' Climate Activist Greta Thunberg Addresses UK Parliament

Gajanan, M. (April 2019). *Time.com.* https://time.com/5577251/greta-thunberg-uk-mp-speech-climate/

Swedish climate change activist Greta Thunberg calls the UK's response to climate change "beyond absurd" in a speech to members of parliament in April 2019. She states: 'The fact that we are speaking of "lowering" instead of "stopping" emissions is perhaps the greatest force behind the continuing business as usual.' The article also includes a 4 minute video entitled "It Will Be Too Late for My Generation," which shows other US teenage activists voicing their opinions about recent global responses to climate change.

Barriers across governance

Paper: Infrastructure for sustainable development

Thacker, S; Adshead, D., Fay, M., Hallegatte, S., Harvey, M., Meller, H., O'Regan, N., Rozenberg, J., Watkins, G., & Hall, J.W. (April 2019). *Nature Sustainability*, 2, 324–331. https://www.nature.com/articles/s41893-019-0256-8

Infrastructure is essential to minimise the impact of humankind on the environment. However, it can also create harmful social and environmental impacts, increase vulnerability to natural disasters, and leave an unsustainable burden of debt. This article shows that infrastructure either directly or indirectly influences the attainment of all SDGs, including 72% of the targets. The next step is to project infrastructure performance into the future, subject to drivers of future change, which include population growth, urbanisation, economic development, climate change, infrastructure deterioration, and obsolescence.

Paper: Multi-level governance and power in climate change policy networks

Di Gregorio, M., Fatorelli, L., Paavola, J., et al. (January 2019). *Global Environmental Change*, 54, 64-77. https://doi.org/10.1016/j.gloenvcha.2018.10.003

This paper proposes an innovative theoretical framework that combines institutional and policy network approaches to study multi-level governance. The framework is used to derive various propositions on how cross-level power imbalances shape communication and collaboration

across multiple levels of governance. The paper identifies major barriers to cross-level communication and collaboration between national and sub-national levels. These are due to power imbalances across governance levels that reflect broader institutional differences between federal and decentralised systems of government. In addition, powerful communities operating predominantly at the national level hamper cross-level interactions. Analysis also reveals that engagement of national level actors is more extensive in the mitigation and that of local actors in the adaptation policy domain, and specialisation in one of the climate change responses at the national level hampers effective climate policy integration in the land use sector.

Solutions

1. Communication

TED Talk: The most important thing you can do to fight climate change: talk about it

Hayhoe, K. (November 2018). 17 minutes.
https://www.ted.com/talks/katharine_hayhoe_the_most_important_thing_you_can_do_to_fight_climate_change_talk_about_it?language=en

Climate scientist and professor of political science Katharine Hayhoe shows how the key to having a real discussion on climate change is to connect over shared values like family, community and religion - and to prompt people to realise that they already care about a changing climate. Other ***Top 20 TED Talks on Climate Change: Ranked By IBM Watson*** can also be found here.

Webinar: Making Climate-Resilient Infrastructure the Norm

Global Center on Adaptation (GCA) and International Institute for Sustainable Development (IISD) (July 2019). 1.5-hours. https://www.youtube.com/watch?v=H9aYrWAznvg

This webinar "Making Climate-Resilient Infrastructure the Norm" occurred on 1 July 2019. Topics discussed include the economics of climate risks, including sustainable asset valuation for infrastructure investments and road infrastructure in the face of climate change (using a Moroccan case study); along with multi-stakeholders' partnerships that deliver. As well as contributions from the GCA and IISD, speakers also included the Oxford Environmental Change Institute and the International Road Federation. More information can be found here.

2. Use guidance

Book: There is no Planet B - A Handbook for the Make or Break Years

Berners-Lee, M. (March 2019). Cambridge University Press, 288pp. https://theresnoplanetb.net/

This handbook by Institute for Social Futures at Lancaster University professor and carbon emissions consultant Mike Berners-Lee examines what it would take to reduce emissions to nearly zero - and, even more importantly, what sort of civilisation might be able to accomplish this. Unlike other books, the challenge is framed not as a technological problem, but rather as a question of values (such as sharing, cooperation, truth, and valuing every human life equally). Only a global deal to cut emissions will allow us to maintain a habitable planet. In his view, this requires global governance, including a global carbon price – however, this will mean wealth

redistribution and less emphasis on gross domestic product as a measure of success. It is organised as sets of questions, which makes it easy to flip through, but somewhat harder to read cover to cover.

Report: Under 2°C: mission possible

Mott MacDonald (July 2018). https://mottmac.blob.core.windows.net/media-manager-uat/817373

This is a "back-casting" report set from 2050, looking back at the likely milestone events necessary to get us all firmly on the 2°C Pathway. It is underpinned by new thinking from the financial industry and civil society that is giving the climate agenda new drive and urgency. The report looks at the positive harnessing of technology to deliver this change. However, it is not shy of highlighting the challenges that still lie ahead.

3. Cooperation and engagement

Paper: Does environmental peace-making between states work? Insights on cooperative environmental agreements and reconciliation in international rivalries

Ide, T. (February 2018). *Journal of Peace Research*, 55(3), 351-365.
https://doi.org/10.1177/0022343317750216

Scholars as well as policymakers have repeatedly articulated concerns about the possibility that environmental stress facilitates armed conflict. The literature on environmental peace-making argues that cooperation in the face of shared environmental challenges can facilitate further cooperation, trust building, and eventually peace between states in conflict. Empirical research on environmental peace-making, predominantly conducted in the form of single case studies, has so far been inconclusive. This article uses a cross-case, multi-method research design to test the environmental peace-making proposition.

Article: Courting Catastrophe? Humanitarian Policy and Practice in a Changing Climate

Nagoda, S., Eriksen, S., & Hetland, Ø. (July 2017). *IDS Bulletin*, 48(4), 125-139.
https://opendocs.ids.ac.uk/opendocs/handle/123456789/13141

What is the level of convergence between humanitarian interventions and efforts to support adaptation to climate change, and what lessons can be drawn from current experience on the prospects for reducing the risk of climate change causing increased burdens on humanitarian interventions in the future? This IDS Bulletin is a call for increasing engagement between humanitarian aid and adaptation interventions to support deliberate transformation of development pathways. It is based on studies from the 'Courting Catastrophe' project.

Paper: Micro-solutions to global problems: understanding social processes to eradicate energy poverty and build climate-resilient livelihoods

Tàbara, J.D., Takama, T., Mishra, M. et al. (May 2019). *Climate Change*, 1-15.
https://link.springer.com/article/10.1007/s10584-019-02448-z

This research explores the agent dynamics, learning processes, and enabling conditions for the implementation of microscale win-win solutions that contribute to energy poverty eradication and

climate resilience in a selection of low-income rural and peri-urban communities in India, Indonesia, and South Africa. This analysis identifies five elements critical for the robust design of these interventions. The authors conclude that the most critical aspect of successful micro win-win solutions is support for communities' own endogenous transformative capacities as this helps ensure that solutions are shared and continuously adapted to changing conditions over time.

4. Planning future changes

Video: A Way Forward: Facing Climate Change.

National Geographic (August 2012). 8 minutes. https://video.nationalgeographic.com/video/way-forward-climate

This short documentary explores the global impact of climate change and its devastating effects, and outlines a response suggested by United Nations' scientists. A series of images highlight the current evidence and possible future of our changing climate (sea level rise, flooding, loss of biodiversity, pressure on food supplies, glacial melt, and decline in drinking water). The way forward includes a range of options, including stabilising GHG emissions; reducing emissions by 2/3 by 2050; improving energy conservation and efficiency; introducing new regulations (e.g. transportation and building codes); raising the price of fossil fuels, and establishing a carbon tax.

5. Use global funding

Article: The world is losing the war against climate change

The Economist (August 2018). https://www.economist.com/leaders/2018/08/02/the-world-is-losing-the-war-against-climate-change

Averting climate change will come at a short-term financial cost. This article uses examples from India and China to explain how politicians have an essential role to play in making the case for reform, and in ensuring that the most vulnerable do not bear the brunt of the change.

Paper: Resilience through interlinkage: the green climate fund and climate finance governance

Bowman, M., & Minas, S. (September 2018). *Climate Policy*, 19, 342-353. https://www.tandfonline.com/doi/full/10.1080/14693062.2018.1513358

The Green Climate Fund (GCF), established in 2010, represents a new kind of funding institution in the emerging field of climate finance governance. It is a significant and potentially innovative addition to UNFCCC frameworks for mobilising increased finance for climate change mitigation and adaptation. However, GCF faces a major reduction in actual funding contributions and also governance challenges at the levels of its Board and the UNFCCC Conference of the Parties (COP), to which it is ultimately accountable. This article analyses these operationalisation challenges with reference to the GCF's internal regulations and its agreements with third parties to demonstrate how exploiting design features of the GCF could strengthen its resilience in the face of these challenges.

6. Use private sector campaigns

Campaign: #SHAPE2030 – The future depends on what we do today

Responsible Business (July 2019). https://www.responsiblebusiness.com/shape-2030/

There is no country in the world exempt from experiencing the drastic effects of climate change first-hand. The #SHAPE2030 campaign is asking organisations to take the lead on reducing emissions and accelerating the global journey to a climate-neutral future. The objective is to create a community of organisations who are taking bold and decisive steps to address climate change. Whether threatened by supply chain disruption, extreme weather events or rising resource costs, forward-thinking businesses need to support bold climate action today. Workstreams include Climate Action, Circular Economy, Food & Nutrition, Human Rights, and Urbanisation.

7. Attend conferences

Report: Shaping the World in 2030: Partnerships for SDG Action

Global Initiatives and UNDP (October 2018). https://www.responsiblebusiness.com/wp-content/uploads/2018/02/RBF-Singapore-2018-Outcome-report.pdf

The Responsible Business Forum on Sustainable Development (RBF), held on 11-12th October 2018 was co-organised by Global Initiatives and the United Nations Development Programme (UNDP). This RBF took on a new, collaborative process for action-driven outcomes and practical solutions across five areas critical to the attainment of the SDGs – Climate Action, Urbanisation, Circular Economy, Human Rights and Food and Nutrition. Across two days, more than 750 delegates convened to collaborate and discuss ways to address these five critical areas. Climate Action participants committed to develop and publish a micro-grid roadmap document for governments of less-developed countries who need help to move beyond their legacy energy systems and modernise their infrastructure and regulation. This roadmap document includes best practices from other countries (as well as future proofing cities), financing options, government partnerships and more, and culminates in a series of dialogues with business chambers of commerce, multilateral banks and agencies, and in a conference in 2019.

Key messages: Global NDC Conference 2019

CDKN (June 2019). https://cdkn.org/?loclang=en_gb

The Climate and Development Knowledge Network (CDKN), organisers of the Global NDC Conference 2019 from 12-14 June 2019 in Berlin, Germany, summarised the three days of discussions among 350 delegates from 80 countries into key messages. More about the conference and the organisers can be found here.

8. Join online training programmes

Training: FutureLearn[4]

1. Transforming Energy Systems: Why Governance Matters

FutureLearn (June 2019). https://www.futurelearn.com/courses/transforming-energy-systems

Tackling climate change demands profound and rapid energy system transformation. This free online training course is run by the University of Exeter. It is anyone with an existing knowledge or interest in energy systems and energy system change to explore: how and why energy systems need to change; what this means for security, people, and costs; what key elements of effective energy governance are, and real-life examples of energy governance from around the world. ***The course started on 17 June 2019, but is still available to join (duration: 4 weeks; estimated weekly study time: 4 hours).***

2. The Impact of Climate Change on Public Health

FutureLearn (July 2019). https://www.futurelearn.com/courses/impact-climate-change-public-health

This free online training course is run by the European Institute of Innovation and Technology (EIT) and EIT Health. It allows those with an existing knowledge or interest in energy systems and energy system change to explore the impact of climate change on public health, and discover ways to influence behaviours and policies at all levels. ***The latest course started on 15 July 2019, but is still available to join (duration: 4 weeks; estimated weekly study time: 4 hours)***.

3. Climate Change: Solutions

FutureLearn (May/September 2019). https://www.futurelearn.com/courses/climate-change-the-solutions

This free course is run by the University of Exeter. It will help you explore the potential solutions to climate change, and how they relate to the SDGs. Solutions to this global challenge including mitigation, adaptation and geo-engineering, which can help avoid the most dangerous climate changes. ***The latest course started on 27 May 2019, but is still available to join. The next course is due on 2 September 2019 (duration: 4 weeks; estimated weekly study time: 3 hours)***.

4. Tipping Points: Climate Change and Society

FutureLearn (June 2019). https://www.futurelearn.com/courses/tipping-points-climate-change-and-society

This free course is run by the University of Exeter. It will help people with a basic knowledge of climate change science discover how rapid changes to natural systems may make Earth look very different in the future. The concept of tipping points (when there's a shift in the state of a

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[4] Most courses run multiple times. Every run of a course has a set start date, but you can join it and work through it after it starts- within 6 weeks. Online registration is necessary.

system towards a new equilibrium) from an interdisciplinary perspective, discovering their role in climate change and the future, is explored. ***The latest course started on 24 June 2019, but is still available to join within 4 weeks (duration: 2 weeks; estimated weekly study time: 3 hours).***

Training: Cornerstone OnDemand Foundation

DisasterReady.org (n.d.). https://ready.csod.com/ui/lms-learner-search/search?pageNumber=1&typeIds=8,524288,1&subjectIds=559&languageIds=1

This website contains a selection of online courses, with a specific interest around disaster risk reduction (DRR) and climate change. Online registration is needed.

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Roz Price, Institute of Development Studies (IDS)

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About this report