18. Quo vadis? The state of social sciences and climate and global environmental change in Europe

by
Carolina E. Adler and Katharina Rietig

Demands for a better understanding of the human dimensions of global environmental change have led to an increase in social science and humanities research in Europe. New strategies and reforms are improving opportunities. Furthermore, research is becoming more relevant for policy and wider societal needs. However, the recognition of the role of social sciences and the humanities in leading and framing global environmental change research agendas has still not been fully realised.

Introduction

Since the *World Social Science Report 2010* (ISSC and UNESCO 2010) social science and humanities research in Europe has grown in scope and interdisciplinarity. However, these trends do not adequately reflect the difficulties that researchers have had in leading and framing research agendas on global environmental change issues. Furthermore, these trends have not been uniform across Europe, reflecting different degrees of development and capacity at individual, national and institutional levels.

This article describes some of these trends within Europe, primarily the European Union (EU). While we are aware that global environmental change encompasses numerous processes of change (to land, oceans and the atmosphere, and to society), we focus on climate change to illustrate three particular issues that link to these trends in context. They are:

- the European context of social science and humanities research on climate change
- research policies and priorities: key climate change issues in the social sciences and humanities
- obstacles to social science and humanities research on climate change issues.

The article concludes with suggestions for further work to address the gaps identified.

The European context

Europe's role in facilitating research

Climate change is increasingly important in European policy-making circles and for the wider European public. Broader environmental issues and sustainable development concerns laid the foundation for this focus and served as important incentives for further European integration. "Sustainable growth respecting the environment" was a major objective of the 1992 Maastricht Treaty[1] (Article 2). The treaty also introduced the "polluter pays" principle, the "precautionary principle" and "environmental policy integration" as minimum environmental standards (Article 130 r-t). The 1997 Amsterdam Treaty[2] added sustainable development (Article 1.2) as a key objective.

Global environmental change appeared on the international agenda during the 1972 UN Conference on the Human Environment in Stockholm, Sweden, after which the United Nations set up the World Commission on Environment and Development (WCED). Following extensive public consultation, the Brundtland Commission provided the highly influential definition of sustainable development in its report, *Our Common Future* (WCED, 1987). It centred upon combining economic development with environmental and social protection. These developments resulted in the institutionalisation of environmental issues within non-governmental organisations (NGOs) and political parties in Western Europe.

However, this change was not uniform across Europe. In Central and Eastern Europe, environmental studies and research remained technocratic disciplines under communist rule. Because "nature" and "the environment" were detached from social contexts, social-scientific research on global environmental change was an alien concept, although opposition and dissident movements viewed environmental issues from a social and political perspective. They began to voice concerns regarding global environmental change issues in the 1980s, inspired by emerging green movements in Western Europe.

The Chernobyl disaster in 1986 was fundamental in raising awareness of environmental issues in Central and Eastern Europe. It was also an important basis on which post-communist environmental NGOs and, in part, the growing social science and humanities research community on the environment were built. Yet for many nations in Central and Eastern Europe, environmental issues were off the political agenda for many years.

While transnational problems such as water and air pollution were key issues of concern in Europe, the UN Conference on Environment and Development (Rio Earth Summit) in 1992 marked a second peak of European and international concern. The conference led to the creation of the UN Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity, and the Convention to Combat Desertification. During the 1990s and early 2000s, political leaders and wider society – including NGOs, the media, and social and natural scientists – recognised climate change as a major challenge of the 21st century. The increasing evidence presented by the Intergovernmental Panel on Climate Change (IPCC) and the effect on the public, for example, of Al Gore's documentary *An Inconvenient Truth* enabled this development. In 2007, the IPCC and Al Gore were awarded the Nobel Peace Prize for their role in increasing awareness of climate change as a policy priority.

Following the negotiation of the Kyoto Protocol in 1998, the European Union assumed a leadership role in international climate negotiations. At the 2011 UNFCCC conference in Durban, South Africa, the European Union agreed to a second commitment period for the Kyoto Protocol. To continue negotiations towards a post-Kyoto treaty, to take effect by

2020, the European Union also agreed to provide finance for mitigation and adaptation in developing countries (Rajamani, 2012).

Under pressure to implement the Kyoto Protocol's international emissions reduction, the European Union set up the "20-20-20 by 2020" strategy (Jordan et al., 2010) to:

- reduce EU greenhouse gas emissions by 20% from 1990 levels
- increase by 20% the share of EU energy consumption from renewable resources
- improve energy efficiency by 20%.

These targets also contribute to prioritising sustainable growth as a key objective of the Europe 2020 strategy, the European Union's vision for a social market economy in the 21st century.

Environmental NGOs have a strong presence in the European Union and receive financial support for their activities. They carry out campaigns to raise awareness among the public, and lobby European and national policymakers to consider and strengthen environmental objectives in their legislative proposals. Environmental and climate change concerns are increasingly recognised by businesses in their corporate social responsibility activities and via the increasing uptake of corporate environmental strategies.

The importance of climate and global environmental change issues in politics, society and business is also reflected in research agendas. Concerns about environmental degradation have motivated and influenced natural and social scientists' research. Research funding agencies have also adapted their funding frameworks to reflect increasing socio-political concerns. Furthermore, the high profile of the IPCC's assessment reports is an important way in which environmental science can contribute to the decision-making process. Having joined the European Union between 2004 and 2007, and thus having access to EU research funding, has motivated some countries in Central and Eastern Europe to carry out more global environmental change research.

Public research-funding institutions have set up further funding opportunities for research on global environmental change issues, including climate change. These include the Sixth and Seventh Framework Programmes (FPs) for research of the European Commission, the European Research Council, the European Science Foundation (soon to be Science Europe), and national funding bodies. EU member states' government departments and the Directorates-General of the European Commission are supporting more policy-relevant research. Many social scientists continue to co-ordinate their efforts through research programmes such as the Earth System Governance project.[3]

How has social science and humanities research influenced decision-making in Europe?

The European Commission proposes environmental legislation and contributes to decision-making in the Council of the European Union and in the European Parliament. Research findings are especially relevant in the early stages of drafting policy proposals. The Directorates-General for Climate Action (DG CLIMA) and Environment (DG ENV) commission studies when specific input is needed, connect with researchers in meetings and conferences, collect scientific evidence, and reflect on its usefulness for specific policy proposals. Research findings are integrated as a formal input to Green Papers, White Papers, Impact Assessments and Communications of the European Commission to the Council of the European Union and European Parliament. The EU

Chief Scientific Advisor also provides input before policy proposals are put forward by the European Commission.

Members of the European Parliament report that they make extensive, but selective, use of scientific input given their time and resource constraints. However, the timely contribution of scientific knowledge as evidence to support climate and global environmental change policy processes has not always been as effective as it might be in influencing policy (e.g. see Lövbrand, 2011).

Decision makers also use research findings from government institutions such as research institutes and expert commissions. Examples include the Joint Research Centre of the European Commission, the Fraunhofer Institute in Germany and the Royal Commission on Environmental Pollution in the United Kingdom, which contributed to the development of the United Kingdom's climate targets (Owens, 2010).

While researchers are frequently included in environmental and climate decision-making via formal and informal channels, their engagement with the media is less active. Academic literature is still the dominant form of dissemination for research findings, although it can be inaccessible to the mass media. Social media, blogs, and the fact that research funding criteria now include the need to consider wider impacts, are providing increasing incentives for researchers to disseminate their findings more widely and to engage more actively with society. More research institutes and universities are employing media experts who focus on communicating research findings and their policy implications.

Type of research and research practices

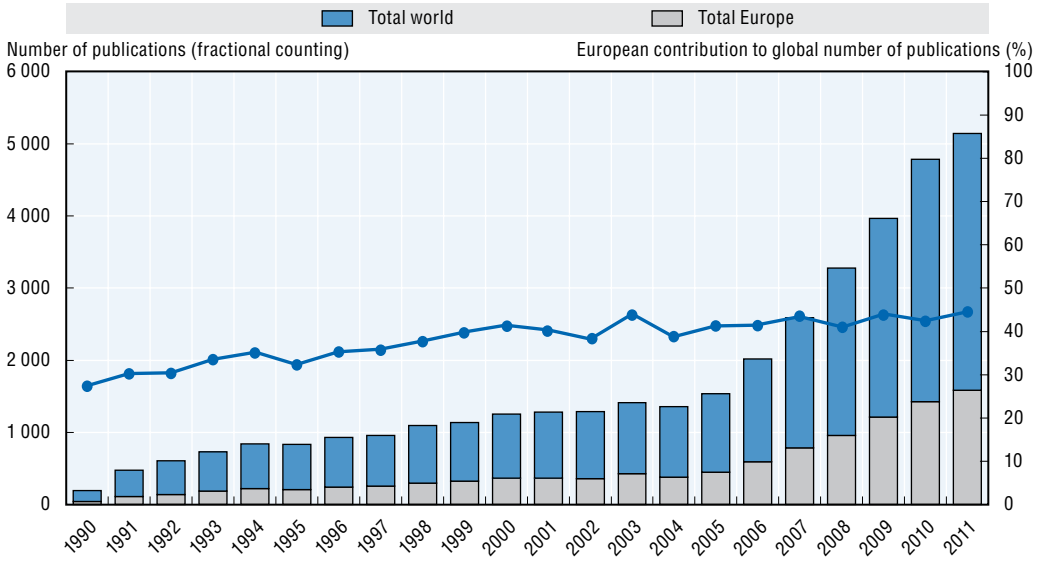
Globally, research on climate and global environmental change has grown rapidly over the past two decades, for instance when referring to the number of publications as a measure of research output (see Figure 18.1).

Since 2005 a marked increase in the number of publications on climate and global environmental change is observable across the globe, yet the rate of increase in Europe has been slightly more gradual (see Figure 18.1).[4] A gradual increase is also observable in the proportion of publications originating from Europe, with contributions to global numbers increasing from 27% in 1990 to 44% in 2011 (Figure 18.1).

While the contribution of European publications to the global total is considerable, the proportion of publications within the two broad European regions is markedly different (see Figure 18.2). Despite an increase in publications originating from Southern, Central and Eastern Europe, particularly since 2006, the total is small in absolute numbers compared with publications originating from Western Europe.

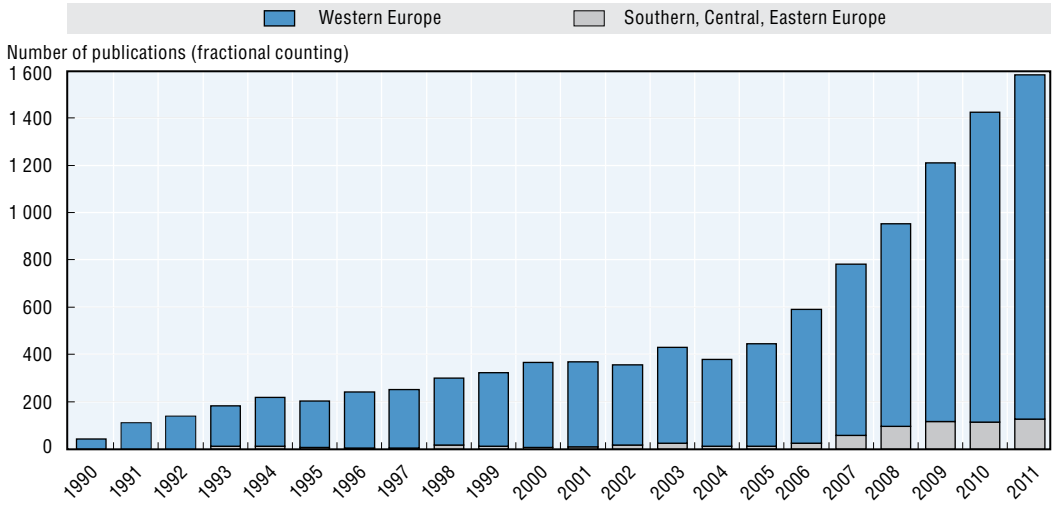
Despite the multilingual and multicultural context that defines Europe, the publication and dissemination of scientific knowledge is primarily conducted in English. This is a long-standing trend, particularly since the Second World War (Truchot, 2002), reinforced by developments in science communication and digital technologies, and the career incentives to publish in top-tier journals. These journals serve as "reference" in any given field, are predominantly in English, and receive priority indexing in the databases that are largely relied upon for evaluating scientific output and impact (Truchot, 2002).

Figure 18.1. **Proportion of European social science publications worldwide on global environmental change, 1990 to 2011**



Note: See article by Ludo Waltman, Annex B1, for information on methodology used and definitions.
Source: Web of Science. Annex B, Table B-4.

Figure 18.2. **Number of social science publications on global environmental change, regional proportions within Europe, 1990 to 2011**



Note: See article by Ludo Waltman, Annex B1, for information on methodology used and definitions.
Source: Web of Science. Annex B, Table B-4.

Funding for climate and global environmental change research in Europe

European funding has a diverse and layered structure. It increasingly involves mixed funding models, which include public and private streams at national and regional levels (van Langenhove, 2010). Overall, European efforts to provide funding for social science and humanities appear promising. These efforts, however, are still small compared with funding in other fields. For example, the EU FP7's theme of Socio-economic Sciences and Humanities was one of the world's largest research funding schemes in this field, yet it

was proportionally smaller than the ten theme-oriented programmes identified by the League of European Research Universities (LERU, 2012). EU-based funding schemes are the most popular sources of funding in terms of the number of applications submitted, followed by national research funding agencies. However, most researchers receive funds at the national level, resulting in a diverse mix of public, private and institutional funding throughout Europe (Marimon et al., 2011).

In future, Horizon 2020 is expected to play a major role in facilitating a more streamlined funding process in Europe. Climate action is one of the priorities identified in the European Commission's 2011 proposal. At least 60% of the total Horizon 2020 budget is earmarked for research on sustainable development, which will address climate and environmental objectives (European Commission, 2011). Around 35 per cent of the Horizon 2020 budget is expected to be spent on climate and related issues (European Commission, 2011). The European Parliament and European Council have been negotiating the content and budget for Horizon 2020 since early 2013; laws regulating it are expected to be adopted by the end of 2013. (See more on Horizon 2020 below.)

Research policy and priorities

Social science and humanities research in the area of climate and global environmental change concentrates on the human dimensions at all levels. It addresses the social, behavioural, cultural, economic and political factors of how climate and broader global environmental change impact societies, and vice versa, as well as the complex links between them.

The International Human Dimensions Programme conducted a survey of researchers involved in the social dimensions of global environmental change research, and identified four research areas of primary importance:

- equity and equality, including wealth and resource distribution
- policy, political systems, governance and political economy
- economic systems, economic costs and incentives
- globalisation and social and cultural transitions (Duraiappah and Rogers, 2011).

Although the survey included the views of scholars from all over the world, almost a third (32.5%) of respondents were based in Western and Central Europe. It does therefore partly reflect views found in Europe and the relative importance and prevalence of global environmental change research in Europe.

Most research on the human dimensions of global environmental change focuses on describing the impacts and people's vulnerability and adaptation to climate change (Rosenzweig and Wilbanks, 2010). These are also reflected in the types of research projects that European-based researchers have completed or are still working on. Other demands for research include requests for scientific advice, evidence-based energy and climate policy, and climate change mitigation technologies (Mejlgaard et al., 2012). However, there are also increasing calls to broaden the scope of this research, by focusing on the links between mitigation and adaptation (EEA, 2012), and by tackling fundamental societal transformation to achieve sustainable development as envisaged by the ten-year initiative Future Earth.[5]

Horizon 2020 is also shaping the agenda of future research in Europe. Horizon 2020 is a financial instrument intended to implement the "Innovation Union" strategy and to provide

support to EU efforts to secure global competitiveness within Europe.[6] The European Commission's legislative proposal to regulate Horizon 2020 involves six social challenges: health, food security, energy, transport, climate action and societies. All six are highly relevant for human dimensions of global environmental change research (ALLEA, 2011; LERU, 2012). It is expected that these research priorities will give a more prominent role to the social sciences and humanities in the agenda-setting process for all six challenges, not just those deemed to be most significant for the field (LERU, 2012).

Obstacles to social science and humanities research on climate and global environmental change issues

In addition to funding, the main obstacles to social science and humanities research on climate and global environmental change mainly involve status and recognition. They are often seen mainly as a support for research agendas and problems framed in the natural sciences. Interdisciplinary collaboration between these fields is still hierarchical, with natural scientists calling on social scientists to help communicate findings and bridge the divide between science and policy (Hackmann and St. Clair, 2012; Holm et al., 2012). The onus is mostly on social scientists to justify their research and priorities. Low sensitivity towards societal values, culture and cognitive factors has slowed down efforts to drive policy and societal change, often resulting in confusion and distrust regarding the accuracy and legitimacy of climate science (Mejlgaard et al., 2012).

Social sciences unavoidably reflect the social, political, cultural and historical contexts in which they are carried out. In Europe, they inevitably mirror the substantial geospatial and geopolitical differences between Western and Eastern Europe, which have resulted in differences in the field (ESF, 2010, 2012). Historical developments before and after the 1990s have posed unique challenges for global environmental change research in Central and Eastern Europe, particularly regarding ideological pressure and censorship under communist rule (ESF, 2010, 2012). Since the 1990s, and since some of these countries became part of the European Union in the 2000s, climate and global environmental change research on human dimensions have received some recognition and have developed. However, local interest in the social dimensions of global environmental change research remains relatively limited. Research institutions in Central and Eastern Europe are not considered as important as their counterparts in Western Europe. Despite these differences, EU funding instruments are allowing greater flexibility and mobility, thus helping to build capacity (Marimon et al., 2011) as well as disseminating the value of social science and humanities research for global environmental change research in the region (Laursen, 2012).

In conclusion

Demands for greater understanding and knowledge of the human dimensions of global environmental change have resulted in opportunities for social science and humanities research in Europe to develop and increase. While this is a promising trend, challenges remain that also offer important opportunities for future improvement and development.

The main challenges identified here are a lack of recognition for social science and humanities research in framing problems in global environmental change, and differences in research practices within Europe. These appear to disadvantage social sciences and humanities research, especially in Central and Eastern Europe. While adequate funding

options to sustain current efforts and support new initiatives to remedy these shortcomings are imperative, other options also need to be considered.

To strengthen the role of social science and humanities research in setting priorities and agendas, research communities need to identify strategic opportunities where they can present compelling evidence that serves the knowledge requirements relevant within a given stage in the policy process. Closer examination, assessment and evaluation of the quality and impact of the knowledge produced is also needed. The standards, criteria and processes used to assess and evaluate knowledge also need attention, since new knowledge is increasingly interdisciplinary and transdisciplinary, and often combines the natural and social sciences. This would help ascertain the relevance of current evaluation practices in assessing the value of interdisciplinary and transdisciplinary knowledge for policy.

Finally, studies that clarify the importance of multilingual, interdisciplinary co-production of knowledge may help social scientists consider the implications – positive and negative – for the wider multicultural European context in which the human dimensions of climate and global environmental change unfold.

Acknowledgement

We would like to acknowledge and thank Kacper Szulecki, Frank Biermann and Ruben Zondervan for their valuable input and suggestions for improving the content and structure of this article.

Notes

1. *http://eur-lex.europa.eu/en/treaties/dat/11992M/htm/11992M.html*.
2. *http://eur-lex.europa.eu/en/treaties/dat/11997D/htm/11997D.html*.
3. *www.earthsystemgovernance.org/*.
4. Here, the number of publications (fractional) refers to publications that belong to multiple countries, where a "count" is assigned fractionally to each of the countries (or fields). For instance, a publication co-authored by a Dutch and a German author would count as 0.5 publication for the Netherlands and 0.5 publication for Germany. (See Annex B for further information.)
5. *www.icsu.org/future-earth*.
6. *http://ec.europa.eu/research/horizon2020/*.

Bibliography

ALLEA (2011), *Common Strategic Framework for EU Research and Innovation Funding: ALLEA Position Paper on the EC Green Paper*, European Federation of National Academies of Sciences and Humanities, Berlin, *www.allea.org/Content/ALLEA/Task%20Force/CSF_consultation_ALLEA_final.pdf*.

Biermann, F. et al. (2010), "Earth System governance: A research framework", *International Environmental Agreements*, Vol. 10, pp. 277-298, *www.agci.vu.nl/en/Images/Biermann%20et%20al%20%202010%20INEA%20ESG%20Research%20Framework_tcm143-191335.pdf*.

Duraiappah, A. K. and D. S. Rogers (2011), *Survey of Social Sciences Scholars on Engagement in Global Environmental Change Research*, International Human Dimensions Programme on Global Environmental Change (IHDP), Bonn, *www.ihdp.unu.edu/article/read/social-science-survery*.

EEA (2012), "Climate change, impacts and vulnerability in Europe 2012: An indicator-based report", Report No. 12/2012, European Environment Agency, Copenhagen, *www.eea.europa.eu/publications/climate-impacts-and-vulnerability-2012*.

ESF (2010), "SCSS science position paper: Promoting internationalisation of the social sciences in Central and Eastern Europe", Standing Committee for the Social Sciences. Strasbourg, European Science Foundation, *www.esf.org/fileadmin/links/Social/Publications/SPP_MOCEE_2010-07.pdf*.

ESF (2012), *ESF Forward Look: Central and Eastern Europe Beyond Transition: Convergence and Divergence in Europe*. European Science Foundation, Strasbourg, *www.esf.org/publications.html*.

European Commission (2009), *Emerging Trends in Socio-economic Sciences and Humanities in Europe: The METRIS Report Monitoring European Trends in Social Science and Humanities*, European Commission, Brussels, *http://ec.europa.eu/research/social-sciences/pdf/metris-report_en.pdf*.

European Commission (2011), *Proposal for a Regulation of the European Parliament and of the Council establishing Horizon 2020 – The Framework Programme for Research and Innovation (2014-2020)*, European Commission, Brussels *http://ec.europa.eu/research/horizon2020/pdf/proposals/proposal_for_a_regulation_of_the_european_parliament_and_of_the_council_establishing_horizon_2020_-_the_framework_programme_for_research_and_innovation_%282014-2020%29.pdf*.

Floud, R. (2010), "Direction for European social science – the need for a strategy", in ISSC and UNESCO (2010), *World Social Science Report 2010: Knowledge Divides*, UNESCO Publishing: Paris, *www.unesco.org/new/en/social-and-human-sciences/resources/reports/world-social-science-report/*.

Hackmann, H. and A. L. St Clair (2012), *Transformative Cornerstones of Social Science Research for Global Change*, International Social Science Council, Paris, *www.worldsocialscience.org/documents/transformative-cornerstones.pdf*.

Hoekman, J., K. Frenken, and R. J. W. Tijssen (2010), "Research collaboration at a distance: Changing spatial patterns of scientific collaboration within Europe", *Research Policy*, Vol. 39, pp. 662-673, *http://repository.tue.nl/684937*.

Holm, P. et al. (2012), "Collaboration between the natural, social and human sciences in global change research", *Environmental Science and Policy,* Vol. 28, pp. 25-35, *http://dx.doi.org/10.1016/j.envsci.2012.11.010*.

ISSC and UNESCO (2010), *World Social Science Report: Knowledge Divides*, UNESCO Publishing, Paris. *www.unesco.org/new/en/social-and-human-sciences/resources/reports/world-social-science-report/*.

Jordan, A. et al. (2010), *Climate Change Policy in the European Union: Confronting the Dilemmas of Mitigation and Adaptation?* Cambridge University Press, Cambridge.

Laursen, L. (2012), "Europe mulls plans to boost research in poorer regions", *Science*, Vol. 336/6086, pp. 1222-1222, *www.sciencemag.org/content/336/6086/1222*.

LERU (2012),"Social science and humanities: Essential fields for European research and in Horizon 2020", *Advice Paper No. 11*, June, League of European Research Universities, Leuven, *http://www.leru.org/files/publications/LERU_AP_11_SSH_Essential_fields.pdf*.

Lonergan, S. (1999), *Global Environmental Change and Human Security: GECHS: Science Plan*, International Human Dimensions Programme on Global Environmental Change, Bonn.

Lövbrand, E. (2011), "Co-producing European climate science and policy: a cautionary note on the making of useful knowledge", *Science and Public Policy*, Vol. 38/3, pp. 225-236, *http://spp.oxfordjournals.org/content/38/3/225*.

Marimon, R. et al. (2011), *Survey on Research Funding for the Social Sciences in Europe*, European University Institute, Max Weber Programme, Academic Careers Observatory, San Domenico di Fiesole, *www.eui.eu/Documents/MWP/Publications/20111012MWP-ACOSurveyResearchFunding-Full.pdf*.

Mejlgaard, N. et al. (2012), *Monitoring Policy and Research Activities on Science in Society in Europe (MASIS): Final Synthesis Report*, European Commission, Luxembourg, *www.masis.eu/files/reports/monitoring-policy-research-activities-on-sis_en.pdf*.

Owens, S. (2010), "Learning across levels of governance: Expert advice and the adoption of carbon dioxide emission reduction targets in the UK", *Global Environmental Change*, Vol. 20, pp. 394-401, *www.deepdyve.com/lp/elsevier/learning-across-levels-of-governance-expert-advice-and-the-adoption-of-IoN2DPVA8f*.

Rajamani, L. (2012), "The Durban Platform for Enhanced Action and the future of the climate regime", *International and Comparative Law Quarterly,* Vol. 61/2, pp. 501-518, *http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=8600936*.

Rosenzweig, C. and T. Wilbanks (2010), "The state of climate change vulnerability, impacts, and adaptation research: Strengthening knowledge base and community", *Climatic Change*, Vol. 100, pp.103-106, doi:10.1007/s10584-010-9826-5, *http://pubs.giss.nasa.gov/abs/ro09010c.html*.

Truchot, C. (2002), *Key Aspects of the Use of English in Europe*, Language Policy Division, Directorate of School, Out-of-School and Higher Education, Council of Europe, Strasbourg, *www.coe.int/t/dg4/linguistic/source/truchoten.pdf*.

Van Langenhove, L. 2010, "The status of social sciences in Europe", in ISSC and UNESCO (2010), *World Social Science Report 2010: Knowledge Divides*, UNESCO Publishing, Paris, *www.unesco.org/new/en/social-and-human-sciences/resources/reports/world-social-science-report/*.

WCED (1987), *Our Common Future*, World Commission on Environment and Development, Oxford University Press, Oxford.

Carolina E. Adler is a research fellow at the Institute for Environmental Decisions at the Swiss Federal Institute of Technology (ETH), Zürich, Switzerland. Her expertise bridges the social and natural sciences at the interface between science and policy, focusing on how scientific and non-scientific knowledge can best serve societies to deal with the effects of global climate change.

Katharina Rietig is a Ph.D. candidate in environmental policy and development at the London School of Economics and Political Science in the United Kingdom. Her research interests include environmental politics and governance, European policy and international environmental negotiations.