

13. Regional divides in global environmental change research capacity

Introduction to Part 2

by
Françoise Caillods

Part 1 presented the urgency and complexity of global environmental change and highlighted the role social sciences should play in analysing the problems and in suggesting solutions. But do social sciences have the capacity to play that role – particularly where people are most vulnerable to the consequences of global environmental change? Part 2 analyses the state of social science research on global environmental change in different parts of the world, and its capacity to address the many complex issues that it raises.

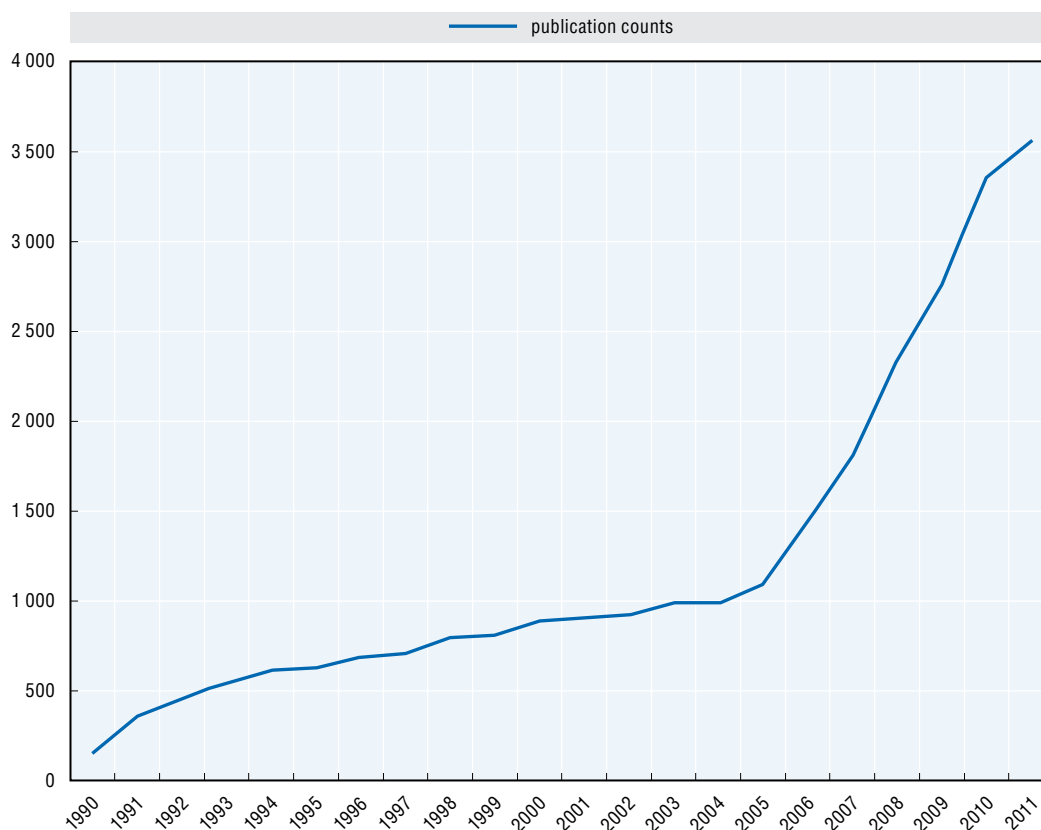
The *World Social Science Report 2010* (ISSC and UNESCO, 2010) outlined the differences between regions and countries in terms of social science research, including its scale, overall condition and ability to produce new knowledge. It showed that countries and institutions in the North Atlantic region enjoyed fairly good research conditions and funding opportunities. Lower-income countries faced a much more critical situation, characterised by inadequate capacity, unsatisfactory research conditions in many universities except the top ones, limited and unstable funding, low priority with national funding agencies, and generally low institutional support. This resulted in an astounding discrepancy in the number of articles registered in the Web of Science (WoS) database, and the hegemony of the North in social science production. Does global environmental change social science research show the same trends as social science research in general? Or have the internationalisation of research and the increasing impact of climate and environmental change on people and communities in different locations resulted in more research being conducted in different countries?

The authors of Part 2 are all social scientists working in the field of global environmental change, and contribute knowledge of its standing in their region or country. Some work for their national research council; others have contributed to the drafting of Intergovernmental Panel on Climate Change (IPCC) assessment reports, or are involved in the global environmental change-related work of regional councils for social sciences. They all benefited from the bibliometric analysis carried out for the International Social Science Council (ISSC) by the Centre for Science and Technology Studies (CWTS) at the University of Leiden (as presented in Annex B).¹ Regional social science research councils (and ISSC members) also present their perspectives on how global environmental change affects their societies and how far their councils help shape research agendas and promote social science research on global environmental change in their regions.

The Latin American Council of Social Sciences (CLACSO), the Council for the Development of Social Science Research in Africa (CODESRIA) and the Organization for Social Science Research in Eastern and Southern Africa (OSSREA) are very active in this area. This is less true of the Association of Asian Social Science Research Councils (AASSREC) and even less so for the Arab Council for the Social Sciences (ACSS).

Social scientists in the United States and Europe have been studying global environmental change issues for several decades. But the emergence of climate change as a global issue in the 1990s – before and after the Rio Earth Summit of 1992 – stimulated a rapid growth of social science analysis throughout the world (see Figure 13.1). Since 2005, the number of publications on global environmental change in WoS social science journals has increased even more rapidly.²

Figure 13.1. **Social science publications on global environmental change per year, 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 B1.

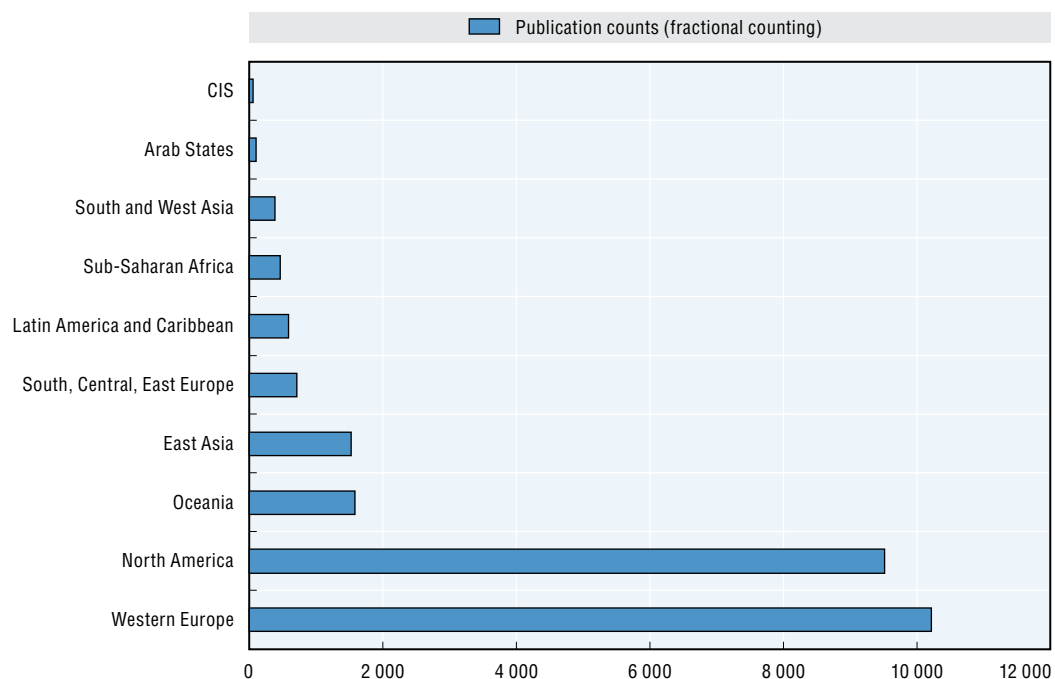
The consequences of global environmental change affect all regions, in different ways. The drivers of research include water and air pollution, dramatic nuclear accidents (Europe, Japan), the consequences of the El Niño oscillation and the geopolitical importance of Amazonia (Latin America), droughts, desertification and deforestation (Arab states, Africa), heat waves, storms and hurricanes that impact economies (United States, South Asia), the consequences of glacier melting (India, Latin America), permafrost thawing (Russia) and sea-level rises (India, Bangladesh).

Natural scientists have long dominated research into global environmental change issues. With the partial exception of the United States and some European countries, social scientists remain relatively marginal in this area.

Formidable disparities between and within regions in the number of global environmental change publications

There is wide disparity in social science research and outputs on global environmental change in the different regions (see Figure 13.2).

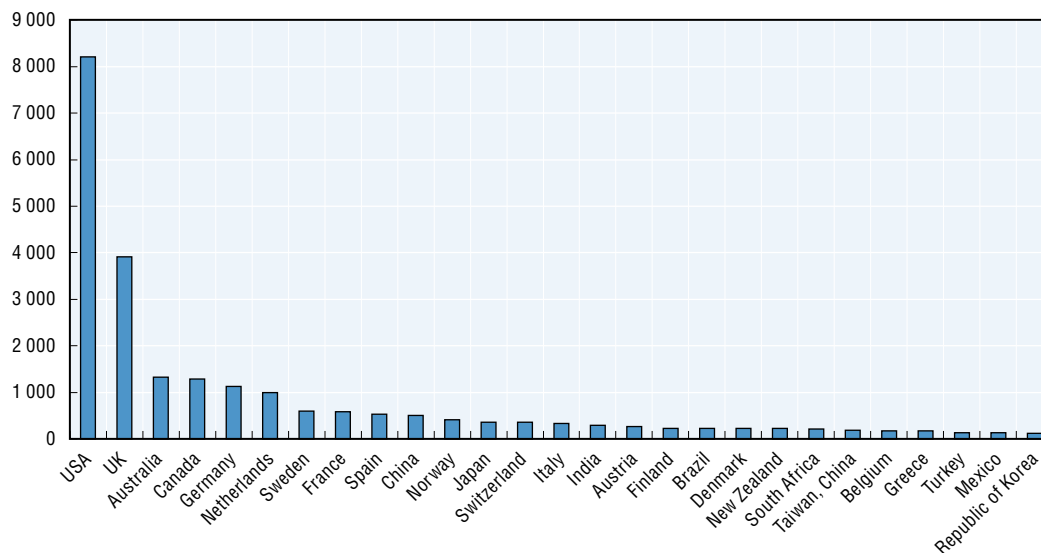
Figure 13.2. **Number of social science publications on global environmental change per region, 1990 to 2011**



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

The regional divide in social science production on global environmental change is at least as big as for the social sciences overall. This is clear from the data on the number of publications in international social science journals registered in the WoS database. Europe – particularly Western Europe – produces the most publications, followed closely by North America. Far behind, yet with a significant production, come Oceania³ and East Asia. Further behind are Latin America and the Caribbean, sub-Saharan Africa and South and West Asia. The figures for two regions are particularly low: the Arab States and the Commonwealth of Independent States (CIS). These two regions are strongly affected by global environmental change but their economies are highly dependent on the sale of oil or gas.

Figure 13.3. **Number of social science publications on global environmental change per country, 1990 to 2011**



Note: Fractional counting. See article by Ludo Waltman, Annex B1, for information on methodology used and definitions.
Source: Web of Science. Annex B, Table B.3.

Even within regions, considerable differences exist between countries. The countries producing the largest number of publications on global environmental change are the United States (by far) and then the United Kingdom (Figure 13.3); next – but far behind – are Australia, Canada, Germany and the Netherlands. Outside Europe and North America, Australia, China, India, Brazil and South Africa are the most prolific centres of research on global environmental change in their regions.⁴ This is not a surprise, since these countries generally have the best resourced science systems in their respective region. China surpassed Japan towards the end of the period 2005-2009. In the past 20 years China has seen the fastest growth in social science research on global environmental change (see Annex B, Table B3).

The WoS is known to be biased in favour of English-language journals, and favours articles over books and monographs.⁵ Indeed, the top producers are all from English-speaking countries. Nevertheless, the articles in Part 2 confirm the bibliometric findings that wide disparities exist between regions and nations. This is because of a lack of public funding for social science research in general, and global environmental change in particular, in the South and emerging economies (India, Russia, the Arab States, Africa and until recently China) as well as a lack of interest in these issues among national research funding agencies (see the contributions by Revi and Sami; and Yanitsky, Porfiriev and Tishkov). It may also reflect a lack of interest and motivation among mainstream social scientists, who tend to prefer to study topics on economic growth and development, poverty alleviation and the reduction of inequality, which are considered more central to the core of traditional social sciences.

Again, China is a significant exception. Its production of social science articles on global environmental change in the WoS database increased 30-fold between 1990-94 and 2005-09. The number of articles registered in the national China National Knowledge Infrastructure (CNKI) database has also increased drastically, with a tenfold increase in

four years (2006-10). The CNKI articles, published in Chinese in Chinese journals, are invisible at the international level and their quality and impact are difficult to assess. But the high numbers are an indication of the Chinese government's recent change of priorities, and show the importance of being published in obtaining an academic position.

What topics are social scientists working on?

The variety of global environmental change issues investigated by social scientists in the United States and Europe is considerable. They include the causes and effects of global environmental change on societies, and the complex interaction between these realities (Adler and Rietig). Researchers work at local, national and global levels, and deal with both specific and cross-cutting issues. They devise new theoretical frameworks and paradigms as well as new methodologies (Wilbanks, Dietz, Moss and Stern). The scale and diversity of this knowledge production underline the domination of North Atlantic research in this area.

A bibliometric analysis of the content of articles carried out for this Report identified 13 clusters of research themes.⁶ Figure 13.4 shows that research covers a variety of topics, but is mostly concerned with modelling energy systems (Western Europe, North America and Asia), the vulnerability and resilience of socio-ecological systems (North America, Western Europe, Oceania as well as Africa and Latin America) and environmental governance (North America, Europe).

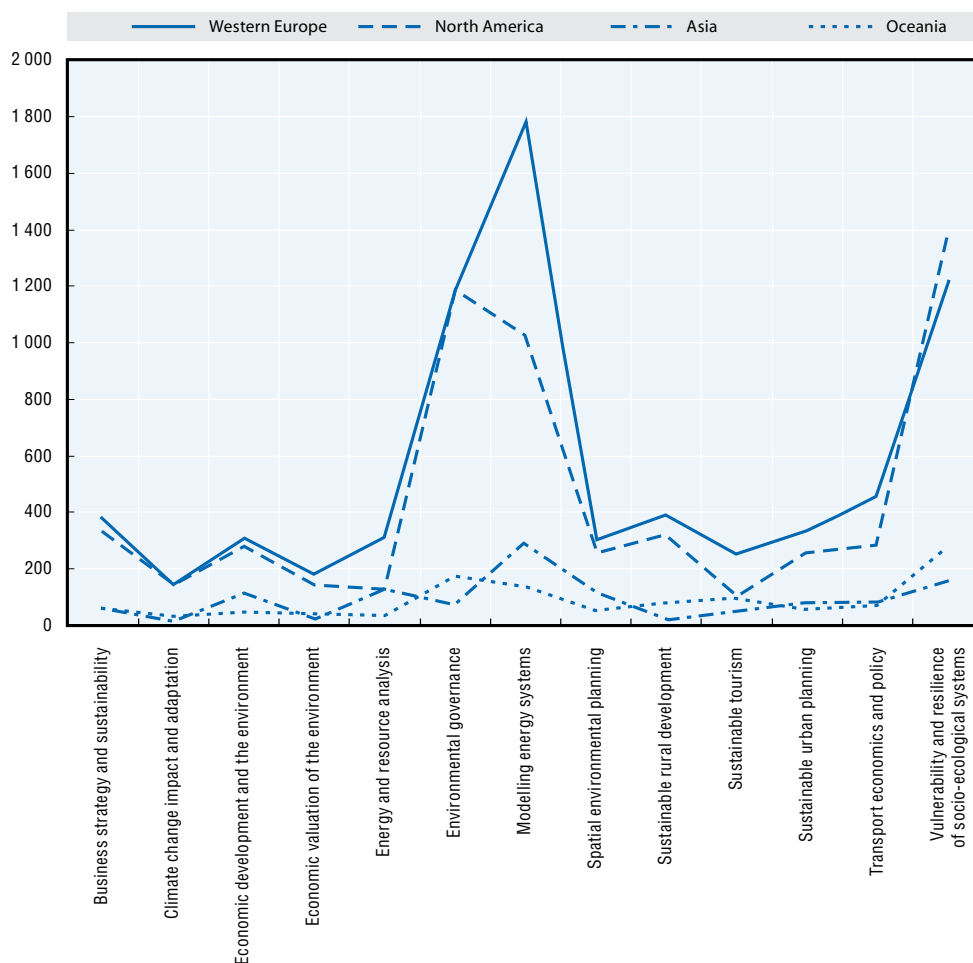
The first social scientists to become involved in global environmental change research in emerging and Southern countries were often geographers and economists, sometimes in co-operation with researchers from developed countries or from international organisations. Geographers analyse among other things the impact of climate change on local populations and the economy, and examine possible forms of adaptation. Economists look at the costs of adapting to and mitigating against climate change, future energy development scenarios, greenhouse gas emission scenarios or carbon trading systems. This kind of research, largely driven by government demands, predominates in China and Russia.

Social scientists in Latin America and Africa look at a wider variety of issues, including the complex pathways and loops of deforestation (Postigo, Blanco Wells and Chacón Cancino) and equitable forest management for environmental sustainability (Vogel). In addition, they revisit themes such as inequalities from a global environmental change perspective (Lampis; Postigo et al.) and highlight work on social movements (Alonso and Maciel). In Africa, the relationship between land ownership, land tenure and resource degradation continues to be a well-researched topic. Social scientists are also prominent in work on "green grabs", land grabs and new forms of land and resource expropriation through carbon sequestration (Murombedzi).

Slow move to interdisciplinary research

The social sciences have grown beyond traditional disciplinary boundaries in most developed countries. Interdisciplinary research is increasing across the social sciences and with the natural sciences, and is encouraged by funding agencies (Wilbanks et al.; Uyar). In Japan, interdisciplinary research has been very much promoted since the triple Fukushima disaster, which cast doubts on natural science's capacity to anticipate or solve problems (Uyar). Yet a good number of publications remain single-authored (30% in 2011), even though this decreased substantially from 1990 to 2011. Outside Europe and the United States,

Figure 13.4. **Number of social science publications on global environmental change by cluster of themes and region, 2000 to 2011**



Note: Only the top-producing regions are shown. See article by Ludo Waltman, Annex B1, for information on methodology used and definitions.

Source: Web of Science. Annex B, Table B.7.

interdisciplinary research seems rare. Social scientists may co-operate across their own disciplines – but still work only rarely with natural scientists (Chen and Xie; Revi and Sami).

Research involving local people and non-academic stakeholders has been practised in Africa and Latin America for some time. Social scientists in Africa work with local people and representatives to create a shared understanding of forestry management systems for climate change (Murombedzi; Vogel; Serageldin; Revi and Sami). Others in Latin America involve local actors and indigenous people in their research processes, so giving them a voice (Lampis; Lavell et al, Part 6). The slow move to interdisciplinary and transdisciplinary research is often attributed to the fact that most decisions concerning hiring and promotion of staff remain within disciplinary departments. The lack of adequate training is also seen as a factor. Funding agencies in the North regret researchers' lack of capacity to conduct transdisciplinary research. Researchers in the North could learn from research practices in Latin America and Africa as they seek to engage at the science-policy-practice interface.

Funding and science policy divide on global environmental change research

Lack of funding for social science research in Southern countries, and lack of support from national funding agencies, weaken their research capacity. In most Southern and emergent countries there is virtually no dedicated funding for social science research on global environmental change issues, and institutional support is limited. Russia and India invest heavily in science and technology research, but devote far fewer resources to the social sciences. Even China, which has recently changed its policy in this respect, supports only a limited number of social science research projects on climate change.⁷ To a limited degree, bilateral and multilateral development agencies make up for this shortfall through specific and short-term project funding, which in turn allows them to influence national research agendas in South Asia, the Arab States and Africa. The situation in developed countries is very different: research funding opportunities do exist in Europe and in the United States.

In Europe, there is a diverse and layered structure of funding schemes at regional and national levels as well as public, private and institutional ones. Having adopted a leadership role in international climate negotiations, the European Union makes significant targeted funding available to natural and social science researchers (Adler and Rietig). Research findings on global environmental change feed into EU policy processes in various ways. By contrast, Wilbanks et al. deplore the relative lack of funding for capacity building and research on global environmental change in the United States. They underline the absence of a national commitment to reduce human impacts on the global environment, which would go a long way to guarantee sustained support for research. It would also increase the likelihood of social science research informing policies.

Funding agencies increasingly regard the impact of research on society as a criterion to assess research quality. But the link with policymakers and society differs widely from country to country. While research may be specifically funded to inform policy in some countries (China; the European Union to some extent), in others, government programmes are prepared with very little involvement by social scientists (Russia, India). Social scientists are possibly responsible for this. They rarely try to share their findings with users of the knowledge they produce, or to communicate their research more effectively to non-academics in general (Wilbanks et al.). Non-governmental organisations (NGOs) and activist movements have, on the other hand, been instrumental in mobilising public opinion in Europe and Latin America, and have played a big role in making things happen.

Overcoming barriers

The articles in Part 2 highlight the many barriers to increasing social science involvement in global environmental change research. These barriers differ from country to country but they encompass the need for stronger political commitment at the highest level. In Southern and emerging countries, lack of adequate funding, and insufficient skills and research capacity is a serious problem. Stronger incentives related to career development and advancement are also badly needed. The lower status of social science research than natural science research is another obstacle. Social scientists feel they are asked to support a research agenda framed by others, with their role limited to areas such as how to change behaviour or how to bridge the science–policy divide.

All the papers below conclude with recommendations for ways forward, and they share many common features. Many emphasise the need for the social science community to integrate environmental issues into its core research agendas. They also encourage stronger advocacy and more effective communication of social science knowledge of global environmental change. The social science community has to take up the challenge. Social science researchers, disciplinary associations, universities and other institutions need to be much more engaged and involved in what is possibly humanity's biggest challenge ever.

Notes

1. The number of publications was assessed using the WoS bibliographic database produced by Thomson Reuters. The method used to identify social science publications on climate change and global environmental change is presented in Annex B1. Publications are considered as social science publications if they appear in a journal classified as social science in the WoS database. Some social scientists, however, publish in journals that are classified as science journals by WoS. This may have led to an underestimation (around 6 to 7%) in the number of social science articles published on global environmental change. There is no reason, however, that this would affect the trend identified by country or discipline.
2. The steep increase in the number of publications appearing after 2005 could be because the WoS has expanded its coverage of the scientific literature.
3. Australia produces by far the most in Oceania.
4. See Annex B.
5. An analysis of Brazil's Scientific Electronic Library Online database (SciELO) was carried out for this Report. SciELO is an open access programme of the São Paulo Research Foundation launched 15 years ago to index and publish national journals, whose model was progressively adopted by other countries in the region. The analysis indicates that 141 social science articles on climate change and global environmental change were written by Brazilian authors and published in Latin American online journals for the period 2005-10. Meanwhile, WoS counted 104 publications by authors based in Brazilian institutions for the period 2005-09. It is not known exactly how much the two databases overlap but many SciELO journals are not registered in the WoS. This gives an indication of the underestimation of the production of social science articles that are not published in English language periodicals in the WoS.
6. See Annex B7. The method used to identify clusters of research themes is presented in Annex B1.
7. Table A6 in Annex A, which compares the number of publications in science, social science and arts and humanities, reflects to some extent what the research priorities are in different countries.

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Françoise Caillods is an economist. She was the senior managing editor of the *World Social Science Report 2010* and senior adviser to the ISSC on the *World Social Science Report 2013*. She was deputy director of the UNESCO International Institute for Educational Planning 2000-08.



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