



Useful references on Science-Policy Interfaces (SPIs)

The brief in brief

In this brief we highlight and describe a few references that are relevant to Science-Policy Interfaces (SPIs) and that we have found useful in the SPIRAL project. The list is of course not exhaustive, and the headers are only indicative: some articles overlap many different headings.

General references on Science-Policy Interfaces (SPIs)

Diaw, C. & Kusumanto, T. 2005. *Scientists in social encounters: the case for an engaged practice of science*. In: Colfer, C.J.P. (ed.). *The equitable forest: diversity, community and resource management*, pp 72-109. Washington, DC, Resources for the Future and CIFOR.

This chapter questions the link between conventional modes of knowledge extraction and local societies' continuous marginality with regard to global knowledge and power networks. Using case studies from Indonesia and Cameroon, it illustrates how social science methods could go beyond just extracting information from local actors to serve as valid platforms for learning interactively and for negotiating meanings, powers, and representation.

Funtowicz, S. & Ravetz, J. 1993. Science for the Post-Normal Age. *Futures* 25(7): 735-755.

A new type of science, 'post-normal' science, is analysed in contrast to traditional problem-solving strategies, including core science, applied science, and professional consultancy. The two attributes of systems uncertainties and decision stakes are used to distinguish among these.

Gibbons, M., Limoges, C. et al. 1994. *The new production of knowledge - The dynamics of science and research in contemporary societies*. Sage Publications, London.

The authors argue that the ways in which knowledge - scientific, social and cultural - is produced are undergoing fundamental changes. The authors show how reflexivity, transdisciplinarity and heterogeneity - connect with the changing role of knowledge in social relations.

Habermas, J. 1971. *Towards a Rational Society. Student Process, Science and Politics*. Beacon, Boston.

These are selected essays from the Frankfurt School on university functions against a democratic background and

on student protests and the faculty's Hobbesian bargain with society. It also reflects how technologically exploitable knowledge can be translated into practical consciousness.

Holmes, J. & Clark, R. 2008. Enhancing the use of science in environmental policy-making and regulation. *Environmental Science & Policy* 11(8): 702-711.

This paper summarises studies undertaken by The Environment Research Funders' Forum (ERFF) of the use of science for environmental policy-making and regulation in the UK to establish what is working, what is not, and why. The aim of the studies has been to inform decisions by ERFF and its members on actions to improve the effectiveness of science in informing environmental policy-making and regulation.

Hoppe, R. (2005). Rethinking the science-policy nexus: from knowledge utilization and science technology studies to types of boundary arrangements, *Poiesis & Praxis: International Journal of Technology Assessment and Ethics of Science*, 3(3), 199-215.

This paper describes how the use of science is often presented as an instrumental problem-solver for policy-makers which does not entirely conform the reality, since knowledge is also used in other complex and interacting ways which include more political or strategic uses.

Hulme, M., Mahony, M., Beck, S., Görg, C., Hansjürgens, B., Hauck, J., Nesshöver, C., Paulsch, A., Vandewalle, M., Wittmer, H., Bösch, S., Bridgewater, P., Diaw, M.C., Fabre, P., Figueroa, A., Heong, K.L., Korn, H., Leemans, R., Lövbrand, E., Hamid, M.N., Monfreda, C., Pielke Jr., R., Settele, J., Winter, M., Vadrot, A.B., van den Hove, S., van der Sluijs, J.P. 2011. Science-policy interface: beyond assessments. *Science* 333(6043):697-8.

This article reflects upon the policy forum "The biodiversity and ecosystem services science-policy interface" by C. Perrings. It states that the framing of the new Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) as a body responsible primarily for assessment is too limited an approach and that the goals of IPBES should be expanded.

Jasanoff, S. 1994. *The Fifth Branch. Science Advisers as Policymakers*. Harvard University Press, Cambridge, MA.

In this study Sheila Jasanoff questions the way in which science advisers shape federal policy. This study combines case studies with institutional analysis to consider what counts as "good science", and the role that science knowledge should be expected to play in public sector decision-making.

Jasanoff, S. 2007. Technologies of humility. *Nature* 450: 33.

This article reflects upon researchers and policy-makers needing ways to accommodate the partiality of scientific knowledge and to act under the inevitable uncertainty it holds.

Lawrence, R. & Després, C. (Eds.) 2004. Futures of Transdisciplinarity. *Futures* 36(4): 397-405.

This paper attempts to clarify the widely used but multiple-interpretable term “transdisciplinary”. Why does transdisciplinarity add to interdisciplinarity and multidisciplinary? Who uses it and why is it valuable in problem solving? How is transdisciplinarity operationalised in research and professional practice?

Norgaard, R.B. 2004. Learning and knowing collectively. *Ecological Economics* 49: 231-241.

This work reflects on the consequences of scholars from multiple epistemic communities using a variety of models and approaches to understand climate change, biodiversity loss, and other large-scale phenomena stemming from how people interact with the environment. How is this happening, how can it be done better, and what are the implications for ecological economics?

Nowotny, H., Scott, P. and Gibbons, M. 2001. *Re-Thinking Science. Knowledge and the Public in an Age of Uncertainty*. Blackwell, Cambridge, UK.

This work presents an account of the dynamic relationship between society and science. The authors argue that changes in society will enhance a two-way communication, thereby transforming science not only in its research practices and institutions but also in its epistemological core.

Nutley, S. M., I. Walter, and H. T. O. Davies 2007. *Using Evidence: How Research Can Inform Public Services*. Policy Press, Bristol, 363pp.

This key reference synthesises the main theories of research used by policy; summarises empirical evidence of how research is used; and identifies practical issues that must be overcome if research use is to be improved.

Owens, S., 2005. Making a difference? Some perspectives on environmental research and policy. *Transactions of the Institute of British Geographers* 30: 287-292.

In this article the author states that much of the conventional wisdom about policy relevant research is grounded in rational and conventional conceptions on the role of knowledge. Before proclaiming new duties for researchers we should do well to look more closely in to the interplay of rationality and power.

Pielke R.A. Jr. 2007. *The Honest Broker. Making Sense of Science in Policy and Politics*. Cambridge University Press.

This book reflects upon the choice scientists have concerning what role they should play in political debates and policy formation, particularly in terms of how they present their research. What considerations are important when deciding, and what are the consequences for the individual scientist and the broader scientific enterprise. The book aims to identify a range of options for individual scientists to consider making their own judgements on how they would like to position themselves in relation to policy and politics.

Pohl, C. 2008. From science to policy through transdisciplinary research. *Environmental Science & Policy* 11(8): 46-53.

This article questions if transdisciplinary research is a useful means of bridging science and policy; and whether transdisciplinarity goes beyond communicating scientific results to public agencies, the private sector, or civil society.

Ravetz, J. 1971. *Scientific Knowledge and its Social Problems*. Oxford University Press, Oxford.

This book analyses science as the creation and investigation of problems and traces how our understanding of science has evolved over the last two decades. The author demonstrates the role of choice and value judgement, and the inevitability of error in scientific research.

Sarewitz, D. & Pielke R.J. 2007. The Neglected Heart of Science Policy: Reconciling Supply of and Demand for Science. *Environmental Science & Policy* 10: 5-16.

This article reflects upon the effectiveness of science portfolios. It conceptualises science in terms of a supply of knowledge and information, societal outcomes in terms of a demand function and science policy decision-making as a process aimed at reconciling the dynamic relationship between supply and demand.

Spierenburg, M. 2012. Getting the message across. Biodiversity science and policy interfaces: A review. *Gaia* 21(2): 125-134.

This paper outlines the challenges of effective science-policy communication on biodiversity issues and outlines some key steps needed for scientists to get engaged in political aspects of biodiversity conservation.

Stirling, A. 2006. Analysis, participation and power: justification and closure in participatory multi-criteria analysis. *Land Use Policy* 23: 95–107.

This paper examines the general relationship between participatory deliberation and quantitative analysis in the appraisal of environmental performance. By exploring some detailed implications for participatory multi-criteria assessment, the paper points towards a more balanced emphasis on these two modes of appraisal.

Van den Hove S. 2007. A Rationale for Science-Policy Interfaces. *Futures* 39(7): 807-826.

This paper outlines justifications for science–policy interfaces, the reasons for their growing importance in environmental governance, and the theoretical and epistemological challenges they pose. Van den Hove looks at the intersections between science and policy to highlight that science and policy, far from being mutually exclusive and hermetic categories are intersecting domains of human activity which are in co-evolution.

Watson, R.T. 2005. Turning science into policy: Challenges and experiences from the science-policy interface. *Philosophical Transactions of the Royal Society B*. 360: 471-477.

This paper presents suggestions on how to improve SPIs, based on the experiences of Bob Watson, a key figure in international assessments, to tackle stratosphere ozone depletion, climate change and biodiversity.

References on SPI characteristics

Cash, D.W., Clark, W.C., Alcock, F., Dickson, N.M., Eckley, N., Guston D.H., Jäger, J., Mitchell, R. 2003. Knowledge systems for sustainable development. *PNAS* 100(14): 8086-8091.

The authors outline the challenges of designing and creating initiatives (boundary organisations) to work across scales, sectors and interests, in order to improve science-policy interfaces.

Farrell, A.E. & Jaeger, J. (Eds.) 2006. *Assessments of regional & global environmental risks. Designing Processes for the Effective Use of Science in Decision making*. Resources for the Future. Washington, DC, USA.

The authors present environmental assessments as the bridge between the expert knowledge of scientists and engineers on the one hand and decision-makers on the other. This book is the result of an international, interdisciplinary research project to analyse past environmental assessments and understand how their design influenced their effectiveness in bringing scientific evidence and insight into the decision-making process.

Van den Hove, S. 2006. Between consensus and compromise: acknowledging the negotiation dimension in participatory approaches. *Land Use Policy* 23(1): 10-17.

In this paper Van den Hove argues that participatory approaches should acknowledge both the irreducible plurality of standpoints and the necessity of common existence in order to be a valuable answer to decision making challenges created by the ecological and societal complexity of environmental issues.

Van der Sluijs, J. 2005. Uncertainty as a monster in the science-policy interface: four coping strategies, *Water Science and Technology* 52 (6): 87-92.

This paper presents a sample of highlights and insights of relevance to the environmental modelling communities, drawn from the international symposium "Uncertainty and Precaution in Environmental Management" (UPEM).

References on learning from existing SPIs

Görg, C., Beck, S., Berghöfer, A., van den Hove, S., Koetz, T., Korn, H., Leiner, S., Neßhöver, C., Rauschmayer, F., Sharman, M., Wittmer, H., Zaunberger, K. 2007. *International Science-Policy Interfaces for Biodiversity Governance - Needs, Challenges, Experiences*. Workshop Report, Helmholtz Centre for Environmental Research, Leipzig: 44pp.

This workshop discussed the needs, gaps and options for an international mechanism on SPIs in biodiversity governance. It was intended to contribute to the IMoSEB consultative process and draws upon the experiences of science-policy interfaces, within and beyond the biodiversity field.

Koetz, T., Bridgewater, P., van den Hove, S., Siebenhüner, B. 2008. The role of the Subsidiary Body on Scientific, Technical and Technological Advice to the Convention on Biological Diversity as science-policy interface. *Environmental Science & Policy* 11(6): 505-516.

This paper provides a critical analysis of the SBSTTA, which has become the centre of heated debates concerning its

function as the science-policy interface of the Convention on Biological Diversity. The authors give reasons for SBSTTA's inherently political role in the current governance process of the CBD, and explore ways to enhance SBSTTA's effectiveness as a science-policy interface, going beyond the usual view that it should merely be "more scientific".

Koetz, T., Farrell, K.N., Bridgewater, P. 2011. Building better science-policy interfaces for international environmental governance: assessing potential within the Intergovernmental Platform for Biodiversity and Ecosystem Services. *International Environmental Agreements* 12 (1), 1-21.

This article addresses implementation failure in international environmental governance by considering how different institutional configurations for linking scientific and policy-making processes may help to improve implementation of policies set out in international environmental agreements.

Neßhöver, C., Müssner, R., Henle, K. & Sousa Pinto, I. 2008. Linking biodiversity research and policy in Europe. *Ambio* 37(2):138-141.

A short description of the science-policy interfaces established by national biodiversity platforms (NBPs) and their integration into a European Platform for Biodiversity Research Strategy (EPBRS) and key factors for success and shortcomings based on the experience gained in these platforms.

Loreau, M., Oteng-Yeboah, A., Larigauderie, A., Babin, D. 2006. Improving the interface between biodiversity science and policy: Towards an International Mechanism of Scientific Expertise on Biodiversity (IMoSEB). Earth Science System Partnership: Beijing, November 9-12.

The focus of the Earth System Science Partnership (ESSP) Open Science Conference was on regions around the world facing unprecedented challenges induced by global environmental change. This paper explores the role of an international science-policy mechanism to bridge science and policy to better address the challenges currently facing biodiversity.

Perrings, C., Duraiappah, A., Larigauderie, A., and Mooney, H. 2011. The biodiversity and ecosystem services science-policy interface. *Science* 331:1139-40.

Using the experience of past assessments of global biodiversity and ecosystem services change and the IPCC this article questions what the policy-oriented changes in the Busan outcome imply for the science of the assessment process.

van den Hove S. & Sharman, M. 2006. *Interfaces between Science and Policy for Environmental Governance: Lessons and open questions from the European Platform for Biodiversity Research Strategy*. Part IV (11): 185-209. In: Guimaraes Pereira, A., Guedes Vaz, S., Tognetti, S. (Eds.) *Interfaces between Science and Society*. Greenleaf, Sheffield.

This chapter aims to clarify, explore and synthesise the conditions, strengths and limitations of real-life interfaces between science and policy-making for environmental governance. The analysis is based on a normative reflection

on the context and scope of such interfaces and on a case study.

Wilson, D.C. 2009. *The Paradoxes of Transparency: Science and the Ecosystem Approach to Fisheries Management in Europe*. Amsterdam University Press, Amsterdam.

This book presents the findings of an extensive sociological survey of the bureaucracy of The International Council for the Exploration of the Sea (ICES)—a network of more than 1,600 scientists from the nations surrounding the North Atlantic and the Baltic Sea— detailing both its failures and the amendments made to Europe's Common Fisheries Policy in attempts to improve and strengthen it.

Wynne, B. 1992. Uncertainty and environmental learning. Re-conceiving science and policy in the preventive paradigm, *Global Environmental Change* 6(1): 111–127.

This paper states that emerging evidence for success on farms of resource-conserving practices must not tempt agricultural professionals into making prescriptions about what constitutes sustainable agriculture. Understanding and solutions can only arise with wide public and scientific participation. New systems of learning are needed, using participatory methods and criteria for trustworthiness which will have profound implications for agricultural professionals.

Looking for more information on science-policy interfaces?

For more SPIRAL results, including references related to SPIs, see companion SPIRAL briefs at <http://www.spiral-project.eu/content/documents>. This brief is a result of research and interactions within and around the SPIRAL project. This brief was written by Kerry Waylen (The James Hutton Institute), Juliette Young and Allan Watt (Centre for Ecology and Hydrology), Sybille van den Hove, Estelle Balian and Rob Tinch (Median), Annamarie Krieg (NIOZ), and Simo Sarkki (University of Oulu).

The **SPIRAL** project studies Science-Policy Interfaces between biodiversity research and policy to improve the conservation and sustainable use of biodiversity. SPIRAL is an interdisciplinary research project funded under the European Community's Seventh Framework Programme (FP7/2007-2013), contract number: 244035.

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