

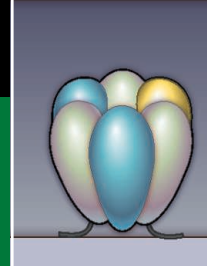
Many facets of an influential ecologist

699



Rotary motor view

704



LETTERS | BOOKS | POLICY FORUM | EDUCATION FORUM | PERSPECTIVES

LETTERS

edited by Jennifer Sills

Fukushima Research Needs World's Support

SERIOUS CONFUSION SURROUNDS THE ACCIDENT AT FUKUSHIMA DAIICHI NUCLEAR POWER Plant with regard to the amount of permissible radiation exposure, particularly in children ("Fukushima revives the low-dose debate," D. Normile, News Focus, 20 May, p. 908; "Citizens find radiation far from Fukushima," D. Normile, News & Analysis, 17 June, p. 1368). The primary reason for this confusion is the lack of scientific evidence (1).

On 29 April, Osako Toshiso, Cabinet Advisor and a professor at University of Tokyo who specializes in radiation safety, offered a tearful resignation. He claimed that the 20-mSv limit on annual radiation exposure for elementary school playground use set by the government was too high, and recommended that it should be lowered to 1 mSv/year. The



government says that these standards are based on those of the International Commission on Radiological Protection (2). These may be suitable for adults, but there is insufficient evidence to argue that the same standards apply to children.

It is now necessary to initiate a large-scale cohort study of childhood thyroid cancer in the Fukushima region. This study would register all children in the affected region; periodically and accurately measure their internal and external radiation exposure; and follow the children for more than 10 years. This would mark the most important scientific study that Fukushima can now offer to the people of the world.

This study would augment the lessons learned from Chernobyl. Although some middle-term (~10 years) and middle-scale studies have been published on Chernobyl (3–6), most recovery projects lacked economic support (7), and the subtle health effects of low-level radiation exposure have yet to be determined. A long-term and large-scale follow-up study of the Fukushima accident can provide firm and reliable evidence for low-dose effects of radiation exposure on thyroid cancer in children.

Given the current confusion and disorder, it would be difficult for Japanese researchers and the Japanese government to execute such a study singlehandedly (8). However, they should not have to organize the effort alone. The risk of childhood exposure to radiation is a real one for people living in any region of the world. It is time to organize an international joint research team supported by countries worldwide to uncover lessons to be learned from Fukushima for the sake of future humanity.

AKIRA AKABAYASHI

Department of Biomedical Ethics, School of Public Health, University of Tokyo Graduate School of Medicine, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-0033, Japan. E-mail: akirasan-tky@umin.ac.jp

References

1. G. D. Zakaib, *Nature* **471**, 419 (2011).
2. International Commission on Radiological Protection, "Fukushima nuclear power plant accident," 21 March 2011; www.icrp.org/docs/Fukushima%20Nuclear%20Power%20Plant%20Accident.pdf.
3. V. A. Stezhko *et al.*, *Radiat. Res.* **161**, 481 (2004).
4. M. D. Tronko *et al.*, *J. Natl. Cancer Inst.* **98**, 897 (2006).
5. A. V. Brenner *et al.*, *Environ. Health Perspect.* **119**, 933 (2011).

6. V. F. Sharifov *et al.*, in "Chernobyl: A Decade," *Proceedings of the Fifth Chernobyl Sasakava Medical Cooperation Symposium*, Kiev, Ukraine, 14–15 October 1996, S. Yamashita, Y. Shibata, Eds. (Elsevier, Amsterdam, 1997), pp. 39–44.
7. *Nature* **471**, 547 (2011).
8. D. Butler, *Nature* **472**, 13 (2011).

Science-Policy Interface: Scientific Input Limited

THE POLICY FORUM ABOUT THE PROPOSED Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) by C. Perrings *et al.* ("The biodiversity and ecosystem services science-policy interface," 4 March, p. 1139) refers to the role of the Platform in strengthening the science-policy interface in biodiversity and ecosystem services, but does not address the fact that science policy formation does not depend solely on scientific facts.

In practice, policy is formed through the intermingling of scientific knowledge, political judgment, and practical considerations (1, 2). Establishing an institution to identify information, perform assessments, identify tools, prioritize capacity-building (3), and evaluate policy options will not necessarily provide a "robust ... science/policy interface" (4) because the science-policy interface is turbulent (5), not linear (1, 2, 6), and scientific input plays only a small role. The scientific information that policy-makers need derives from policy and political processes, not from scientists' perceptions. The science-policy interface can be bridged only when scientists understand this policy process and work with policy-makers to reduce political and policy risk, rather than simply providing scientific facts.

IPBES has not met yet (the first plenary session is scheduled in October 2011). Undoubtedly, IPBES will contribute to global understanding of biodiversity and ecosystem services, but the effectiveness of the Platform in operating across the science-policy interface will depend on how well the

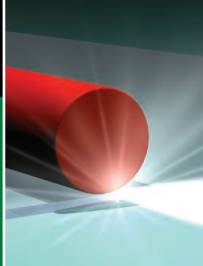
Downloaded from www.sciencemag.org on January 26, 2012

CREDIT: KYODO VIA AP IMAGES



Big difference?

708



Plasmons
in the spotlight

709

scientists associated with IPBES understand the nature of policy.

SUE V. BRIGGS^{1*} AND ANDREW T. KNIGHT²

¹Institute for Applied Ecology, University of Canberra, Canberra 2601, ACT, Australia. ²Department of Conservation, Ecology and Entomology, Stellenbosch University, Private Bag X1, Matieland 7602, South Africa.

*To whom correspondence should be addressed. E-mail: sue.briggs@canberra.edu.au

References

1. H. Püzl, E. Rametsteiner, *Sci. Publ. Policy* **36**, 743 (2009).
2. B. Head, *Aust. J. Publ. Admin.* **67**, 1 (2008).
3. United Nations Environment Programme, "Busan Outcome," Busan, Korea, 7 to 11 June 2010 (www.unep.org/pdf/SMT_Agenda_Item_5-Busan_Outcome.pdf).
4. H. Mooney, G. Mace, *Science* **325**, 1474 (2009).
5. P. Cullen, *Freshwater Biol.* **24**, 201 (1990).
6. D. J. Roux *et al.*, *Ecol. Soc.* **11**, 4 (2006).

Science-Policy Interface: Beyond Assessments

IN THEIR POLICY FORUM "THE BIODIVERSITY and ecosystem services science-policy interface" (4 March, p. 1139), C. Perrings *et al.* frame the new Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) as a body responsible primarily for assessment. They consistently base their elaboration of the work of IPBES on the experiences of past assessments (such as the Millennium Assessment, the Global Biodiversity Outlook, and the Intergovernmental Panel on Climate Change) and interpret the Busan outcome [recom-

mendations made by a 2010 intergovernmental conference (1)] solely through the lens of how scientific knowledge is assessed. We believe that the blueprint suitability of previous assessments for the IPBES process is very limited. Strengthening the (mainly global-scale) scientific knowledge base behind assessments is important, but the goals of IPBES should be expanded.

First, we should move beyond conventional scientific knowledge assessments that legitimize, almost exclusively, only peer-reviewed material. Knowledge established across all scales (especially the knowledge of local and indigenous peoples) and validated in multiple ways must be eligible for inclusion in IPBES processes. Changes in biodiversity are first experienced locally and thus many forms of local expertise have particular relevance for biodiversity issues (2). Second, we should link IPBES assessment results to decision-making at multiple spatial scales (including tackling biodiversity loss at the grassroots level).

Both of these goals require all aspects of capacity-building, including empowerment of different kinds of actors, to be reflected in



Learn how current events are impacting your work.

ScienceInsider, the new policy blog from the journal **Science**, is your source for breaking news and instant analysis from the nexus of politics and science.

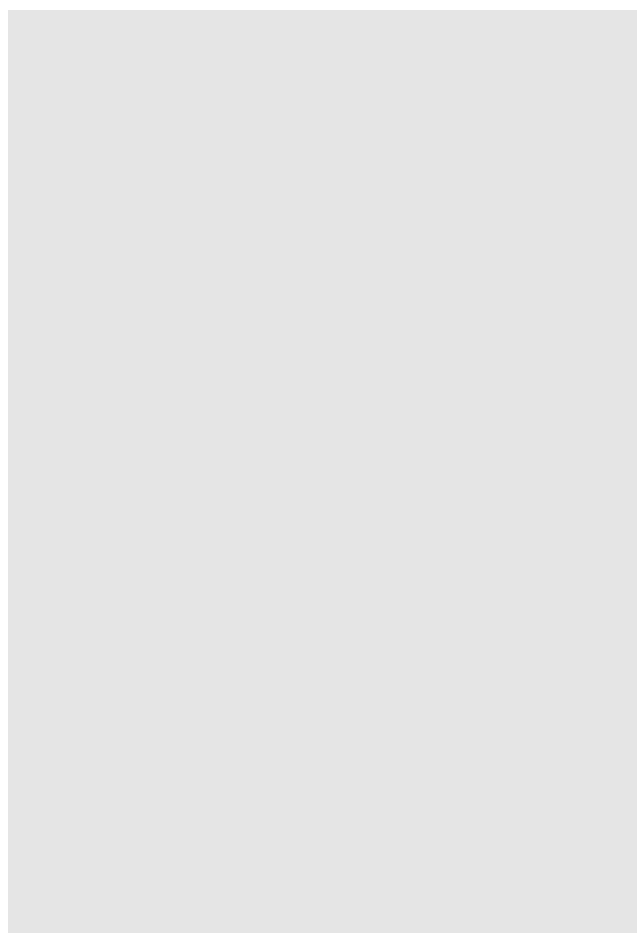
Produced by an international team of science journalists, **ScienceInsider** offers hard-hitting coverage on a range of issues including climate change, bioterrorism, research funding, and more.

Before research happens at the bench, science policy is formulated in the halls of government. Make sure you understand how current events are impacting your work. Read **ScienceInsider** today.

www.ScienceInsider.org

ScienceInsider
Breaking news and analysis from the world of science policy





the structural design of IPBES. To achieve this much broader set of objectives as laid out in the Busan outcome, including the explicit incorporation of local and indigenous knowledge, the IPBES structure should knit together existing multiscale networks (3) of scientific, policy, and stakeholder communities.

MIKE HULME,^{1*} MARTIN MAHONY,¹ SILKE BECK,² CHRISTOPH GÖRG,² BERND HANSJÜRGENS,² JENNIFER HAUCK,² CARSTEN NESSHÖVER,² AXEL PAULSCH,² MARIE VANDEWALLE,² HEIDI WITTMER,² STEFAN BÖSCHEN,³ PETER BRIDGEWATER,⁴ MARITEUW CHIMÈRE DIAW,⁵ PIERRE FABRE,⁶ AURELIA FIGUEROA,⁷ KONG LUEN HEONG,⁸ HORST KORN,⁹ RIK LEEMANS,¹⁰ EVA LÖVBRAND,¹¹ MOHD NOROWI HAMID,¹² CHAD MONFREDA,¹³ ROGER PIELKE JR.,¹⁴ JOSEF SETTELE,¹⁵ MARTEN WINTER,¹⁵ ALICE B. M. VADROT,¹⁶ SYBILLE VAN DEN HOVE,¹⁷ JEROEN P. VAN DER SLUIJS¹⁸

¹Science, Society and Sustainability Group, School of Environmental Sciences, University of East Anglia, Norwich NR4 7TJ, UK. ²Helmholtz Centre for Environmental Research—UFZ, Permoserstrasse 15, 04318 Leipzig, Germany. ³Wissenschaftszentrum Umwelt, Universität Augsburg, Universitätsstrasse 1a, 86159 Augsburg, Germany. ⁴Global Garden Consulting, 2 The Wharfside, Peel, Isle of Man, IM5 1AT, UK. ⁵African Model Forests Network Secretariat, BP33678, Yaoundé,

Cameroon. ⁶CIRAD, Environments and Societies Department, Campus de Baillarguet, 34398 Montpellier Cedex 5, France. ⁷Competitiveness and Social Development, German Development Institute—DIE, Tulpenfeld 6, 53113 Bonn, Germany. ⁸International Rice Research Institute, Los Banos, DAPO 7777, Metro Manila, Philippines. ⁹German Federal Agency for Nature Conservation, Isle of Vilm, 18581 Putbus, Germany. ¹⁰Environmental Systems Analysis Group, Wageningen University, 6700AA Wageningen, The Netherlands. ¹¹Centre for Climate Science and Policy Research, Linköping University, 60174 Norrköping, Sweden. ¹²Strategic Resource Research Centre, MARDI (Malaysian Agricultural Research and Development Institute), 50774 Kuala Lumpur, Malaysia. ¹³Consortium for Science, Policy and Outcomes (CSPO), Arizona State University, Tempe, AZ 85287, USA. ¹⁴Center for Science and Technology Policy Research, University of Colorado, Boulder, Colorado 80309–0488, USA. ¹⁵Helmholtz Centre for Environmental Research—UFZ, Theodor-Lieser-Strasse 4, 06120 Halle, Germany. ¹⁶Interdisciplinary Centre for Comparative

Research in the Social Sciences ICCR, Schottenfeldgasse 69, 1070 Vienna, Austria. ¹⁷Median SCP, Carrer Vista Alegre, 20, 08197 Valldoreix (Barcelona), Spain. ¹⁸Science, Technology, and Society, Copernicus Institute, Utrecht University, Budapestlaan 6, 3584 CD Utrecht, The Netherlands.

*To whom correspondence should be addressed. E-mail: m.hulme@uea.ac.uk

References

1. United Nations Environment Programme, "Busan Outcome," Busan, Korea, 7 to 11 June 2010 (www.unep.org/pdf/SMT_Agenda_Item_5-Busan_Outcome.pdf).
2. W. Reid et al., Eds., *Bridging Scales and Knowledge Systems: Concepts and Applications in Ecosystems* (Island Press, Washington, DC, 2006).
3. Leipzig Workshop Recommendations for a Knowledge-Policy Interface for Biodiversity Governance, 4 October 2006 (www.ufz.de/data/leipzig_recom_final4614.pdf).

CORRECTIONS AND CLARIFICATIONS

News Focus: "Are dolphins too smart for captivity?" by D. Grimm (29 April, p. 526). The story classified TerraMar Research as an advocacy organization. To clarify, TerraMar Research also conducts basic research.

News & Analysis: "Regulatory T cells get their chance to shine" by M. Leslie (27 May, p. 1020). The story incorrectly stated that the regulatory T cells infused into patients by Mauro Di Ianni and colleagues were third-party cells. They actually came from the donors of the blood-forming stem cells.

Letters to the Editor

Letters (~300 words) discuss material published in *Science* in the past 3 months or matters of general interest. Letters are not acknowledged upon receipt. Whether published in full or in part, Letters are subject to editing for clarity and space. Letters submitted, published, or posted elsewhere, in print or online, will be disqualified. To submit a Letter, go to www.submit2science.org.

Special Career Feature: Careers in Japan

The September 2 issue of *Science* includes a special feature on the state of science and recruiting in Japan. Attracting scientists from around the globe promises to be an important strategy for Japan to continue growing in the S&T arena.

With a worldwide circulation of over 130,000 scientists, *Science* connects your organization with the qualified scientists you need to hire. Tell your company's story and attract the best scientific minds to work in Japan.

Special advertising packages available for this issue—contact us for details.

To book your ad, contact:

In the United States, Canada, and Latin America
E-mail: advertise@sciencecareers.org

In Europe and Rest of World
E-mail: ads@science-int.co.uk

In Japan:
E-mail: mhara@aaas.org

In China and Taiwan:
E-mail: rwu@aaas.org

Produced by the AAAS/*Science* Business Office



Science Issue Date:
September 2, 2011
Reserve your ad by August 16

Science Careers

From the journal *Science*



ScienceCareers.org