

Final Report

Dr. Juergen Weichselgartner

Fields: Geography, Vulnerability Research, Global Change

Degree program and institution

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Faculty host at Harvard

Kennedy School of Government, Center for International Development, Science, Environment and Development Group

Description of SSP-related research activity

“Integrating Science and Practice for the Mitigation of Natural Disasters – Barriers, Bridges, Propositions.” The research focused on the influence of scientific assessments on decision making in the practical disaster mitigation arena and the barriers that inhibit the involvement of users in the design of assessments, i.e., the co-production of knowledge.

Abstract

An immense enlargement of both the natural hazards literature and practical disaster mitigation efforts has not reversed the upward trend in disaster losses. The paradox of concurrent increases raises questions about knowledge and approaches used in hazard management. Is the knowledge base inadequate despite the increasing research effort, or is it that existing knowledge is not applied or not used in an effective way? The study examines how twenty scientific assessments from the knowledge domains of vulnerability and resilience are carried out and attempts to uncover what gaps and barriers in the science-policy-practice interface limit the use of research-based knowledge. In addressing the question of “What influence do scientific assessments have on decision makers in the practical disaster mitigation arena?”, a number of linkages between specific vulnerability and assessment determinants as well as factors – functional, structural, and social – are identified that inhibit the production of applied knowledge. It is the quality of these relations that determines the grade of influence of research-based knowledge on action. Factors that aggravate greater coherence among and between actors and arenas typically occur when knowledge is transferred through the traditional pipeline mode in which scientists set the research agenda, do the research, and then transfer the results to potential users. It is suggested to avoid discipline-based non-collective knowledge production, which inevitably generalizes, decontextualizes, and reduces much of what is important about the character of vulnerability and resilience, and to engage in the co-production of knowledge through the close interaction of producers and users, hence building a “knowledge-action system.”

Identification of the problem

Since an immense enlargement of both the disaster-related literature and practical disaster mitigation efforts have not reversed the upward trend in disaster losses, the use of knowledge in hazards management comes to the foreground. How does hazard-related research-based knowledge relate to the

evidently growing toll of losses? Is human knowledge and understanding of the causes of the losses inadequate despite the increasing research effort, or is it that existing knowledge is not applied or not used in an effective fashion?

Key question asked about the problem

- How appropriate and influential is the research-based knowledge to support decision making for vulnerability reduction and building resilience?
- What gaps and barriers in the science-policy-practice interface limit the use of research-based knowledge?
- What influence do scientific assessments have on decision makers in the practical disaster mitigation arena?

The methods by which you answered that question

Case study analysis of twenty case studies – seventeen journal articles, one report, one book chapter, and one book, as well as a questionnaire survey and telephone interviews with forty knowledge producers and fifty-two potential users.

Principle literature upon which the research drew

- Birkmann, J. (2006): *Measuring Vulnerability to Natural Hazards: Towards Disaster Resilient Societies*. UNU Press, Tokyo.
- Dikau, R. & Weichselgartner, J. (2005): *Der unruhige Planet: Der Mensch und die Naturgewalten*. Wissenschaftliche Buchgesellschaft, Darmstadt.
- Gunderson, L.H. & Holling, C.S. (2002): *Panarchy: Understanding Transformation in Human and Natural Systems*. Island Press, Washington, D.C.
- Janssen, M.A. & Ostrom, E. (2006): Editorial - Resilience, vulnerability, and adaptation: A cross-cutting theme of the International human Dimensions Programme on Global Environmental Change. *Global Environmental Change* 16 (3): 237-239.
- Mitchell, R.B.; Clark, W.C.; Cash, D.W. & Dickson, N.M. (2006): *Global Environmental Assessments: Information and Influence*. MIT Press, Cambridge.
- The Social Learning Group (2001): *Learning to Manage Global Environmental Risks - Volume 1: A Comparative History of Social Responses to Climate Change, Ozone Depletion, and Acid Rain*. MIT Press, Cambridge.

Empirical data acquisition description

Twenty case studies were chosen for meeting the criteria of breadth, time and source of publication, and the potential for relevance to practitioners. For each assessment, an analysis sheet was prepared in which information on the author(s), address, title, study location, hazard type, assessment scale, data used, actors involved, research funds, publisher information, SSCI and Google hits, main findings, suggestions given, causes of vulnerability/resilience identified, and – if mentioned – barriers and bridges in the SPPI was saved. To evaluate the influence of the case studies, two questionnaires were designed: one for case study producers and one for potential users of the case study. Both groups were contacted and invited to participate in the study. After establishing contact, the questionnaires were emailed and the authors and potential users returned the questionnaires via email, with follow up occurring over the telephone or email. In total, 40 knowledge producers and 52 potential users have been interviewed.

Geographical region studied

Case studies were located in: Americas (12), Asia (4), Oceania (2), Africa (1), and Europe (1)

Recommendations that might be relevant for your problem

It is worth noting that those potential users who agreed to participate and followed through with reading the relevant assessment and filling out the questionnaire were those, for the most part, who were already the most interested in the intersection of science and practice, and usually were those for whom the identified assessment was the most relevant. In general, the more often a potential practitioner was used to dealing with scientific worlds, the more eager they were to participate in the study. A few potential users were identified through the assessments themselves. For example, if a government institution was involved in funding or formulating a report, that institution could likely be considered a potential user.

Description of major other intellectual or professional advancement activity

Following the work at Harvard's CID, I was appointed Senior Science Coordinator and Deputy Executive Officer of the IGBP/IHDP core project LOICZ (Land-Ocean Interactions in the Coastal Zone).

Reports, papers, publications and presentations that built on the fellowship research

Publications

- Weichselgartner, J. (2006): Soziale Verwundbarkeit und Wissen. *Geographische Zeitschrift* 94 (1): 15-26.
- Weichselgartner, J. (2007): Integrating science and practice for the mitigation of natural disasters: barriers, bridges, propositions. CID Graduate Student and Postdoctoral Fellow Working Paper No. 21. Center for International Development, Harvard University.

Presentations

- "Natural hazards and global change". UNU-EHS PhD Block Course Role of Vulnerability in Risk Management, 4 April, 2008, Bonn/Germany
- „Einfluss wissenschaftlichen Wissens auf Politik und Praxis: Eine empirische Studie zur gesellschaftlichen Verwundbarkeit“. Geographical Colloquium, 7 November, 2007, Basel/Switzerland
- "Impacts of scientific vulnerability assessments". EU JRC Technical Seminar, 11 October, 2007, Ispra/Italy
- "Wissenschaftliche Verwundbarkeitsbewertungen und ihr Einfluss auf Entscheidungsträger: Über Hindernisse and der Wissenschafts-Praxis-Schnittstelle". 56. Deutscher Geographentag, 2 October, 2007, Bayreuth/Germany
- "Linking science and practice in disaster mitigation: barriers, bridges, propositions". AAAS Meeting Science and Technology for Sustainable Well-Being, 19 February, 2007, San Francisco/USA
- "Scientific concepts of vulnerability research and their relevance for global change research". GKSS Research Center, 16 January, 2007, Geesthacht/Germany
- "Influence of vulnerability assessments: linking knowledge and action". 3. Meeting of the UN Expert Working Group Measuring Vulnerability, 1 November, 2006, Florence/Italy
- "Mapping the science-practice interface in disaster mitigation". VARIP Workshop, 21 June, 2006, Oxford/UK.

Principal collaborators outside Harvard

Roger Kasperson, Clark University (and the Vulnerability and Resilience in Practice (VARIP) team)

If you are moving to a new position, please list your contact information there

Dr. Juergen Weichselgartner
Institute for Coastal Research, GKSS Research Center
Max-Planck-Strasse 1, 21502 Geesthacht, Germany
Phone: +49 - 4152 - 871542 / E-mail: j.weichselgartner@loicz.org