

Editorial

Transdisciplinarity in EcoHealth: Status and Future Prospects

As EcoHealth begins a fifth year of publication with this issue, it is a good time to reflect on our progress toward our transdisciplinary mission. The founding editors described transdisciplinarity as the “spirit” behind the journal in our inaugural issue (Wilcox et al., 2004a, b). Other arguments, ideas, and challenges relevant to our transdisciplinary mission at the intersection between the ecological and health sciences were expressed in that opening editorial, some of which are worth paraphrasing here.

We argued that health is a central criterion for sustainability and that understanding the connection requires integrative and cross-disciplinary approaches involving both the above sciences. Moreover, this understanding must include that of “the effects of global change on ecosystem sustainability and on human health; the emergence and effects of pathogens, parasites, and pollutants within human, non-human animal, and plant communities; the interaction between environment, development, and human health; and the management of these challenges across local, regional, and global scales.”

We also stated our “common, overarching purpose is to better understand the connections between nature, society, and health and how drivers of social and ecosystem change ultimately will also influence human health and well-being.” We admitted that these drivers and change not only involved grappling with complexity, but require perspectives from the social and political sciences – in spite of the fact that none of us had such academic credentials (at least disciplinarily speaking).

So, how are we doing toward addressing these needs and our mission? Is the journal measurably contributing to transdisciplinary research at the interface of ecology and health? Assuming we are, at least to some degree, how can we do more? Answering these questions inevitably requires that we consider the meaning of transdisciplinarity in some

depth, at least more so than we have to date. Arguably, we should explicitly and operationally define transdisciplinary research as a basis for devising some benchmarks for measuring our progress.

We cannot in this limited space do justice to this topic nor adequately answer these questions here. Rather we will introduce them and hopefully stimulate a more focused dialogue in the EcoHealth community on the topic, particularly in advance of our society’s 2nd Biennial meeting next December. Plans include one or more workshops on transdisciplinary research and paper writing for our journal.

Definitions of transdisciplinarity in the literature are varied and diverse, but they are characterized by three recurring elements: transcending and integrating disciplinary paradigms (integration), doing research in a participatory way (participation), and orienting research towards real-world problems (problem-orientation) (Pohl and Hirsch Hadorn, 2007). These three dimensions of transdisciplinarity may be a convenient starting point to clarify our understanding of transdisciplinarity within the EcoHealth research community - and based on this we may be better able to assess our achievements and define strategies to improve the quality of transdisciplinary research in our field. The first element, integration of knowledge beyond single disciplines, has been a central tenet for our journal from the very beginning. A large number of crucial causal links between ecological, health and social factors have been identified and studied. We now know that multiple factors as diverse as for instance biotic invasions, wildlife trade, landscape change, biodiversity loss, poverty, and social capital in local communities can be key to understanding ecohealth processes. The application of integrative concepts such as socioecological or coupled human-natural systems and biocomplexity helped to integrate such distinct multiple factors in the context of

emerging infectious diseases (December 2004 EcoHealth special feature on Emerging Infectious Diseases and Social-Ecological Systems). Papers in other issues proposed entirely novel concepts, for instance “chronotones” that integrate concepts from landscape ecology and epidemiology (Bradley, 2004) and new methods for assessing the mental health impacts of ecosystem distress (Higginbotham et al., 2006). It may be time to assess how well our journal is doing overall to encourage these attempts at transdisciplinary integration – indeed, how we can better facilitate the intensive, cross-disciplinary interaction and disciplinary integration required for transdisciplinary research. In this vein, several articles have emphasized the value of integrating nonacademic expertise into ecohealth studies (December 2007 EcoHealth special feature on Indigenous Perspectives or Pesek et al., 2006), and of participatory research approaches in understanding causal relationships from the perspective of the involved actors (Johnston et al., 2007). It may be time to consider how such an approach can also be employed in the editorial policy of EcoHealth. Some transdisciplinary journals use, for instance, a dual peer review process where scientific experts review the scientific quality of research while others, i.e., practitioners with expertise in its application assess the relevance and adequacy in a “realworld” context. The need for contributing to solving critical societal problems has been a major rationale for EcoHealth from the beginning. However, as the above implies, we may need to consider more explicitly how ecohealth research actually can make meaningful contributions to such problem-solving. Realworld problems are often characterized by high scientific uncertainty, a relatively high level of conflicts of interest and values, and institutional barriers. Three types of transdisciplinary research have been identified that address each of these challenges by the type of knowledge they attempt to advance (Pohl and Hirsch Hadorn, 2007). Problem-oriented research may contribute by reducing scientific uncertainty through improved understanding of the causal relations relevant to the problem (systems knowledge). This research may also contribute by clarifying stakeholders’ interests and values (target knowledge) or it may contribute to designing problem-solving practices that take into account the constraints and options of the implementing actors and help to transform application contexts (transformation knowledge). Historically, environmental research, for example, has mainly focused on producing systems knowledge. Yet for problem-solvers the biggest hurdles to solving real-world environmental problems are often related to stake-

holder conflicts or the paucity of adequate problemsolving strategies. In EcoHealth, we have so far mostly published research on systems knowledge, as defined here. We may need to find ways to facilitate research and the publication of target and transformation knowledge, though both types have been dealt with in recent issues. The challenge of clarifying the role of values in ecohealth research has been prominently stated in a recent Ecohealth editorial (Waltner-Toews and Daszak, 2007) and our June 2007 EcoHealth special feature on Wetland Health Indicators. Institutional innovations have been discussed that better reflect the close linkages between ecology and health for management (Robins, 2007, Goy and Waltner-Toews, 2005, Wahbe et al., 2007). However, such research on valuation and implementation has so far been relatively rare and very few, if any, studies have integrated research on systems, target and transformation knowledge. Transdisciplinary research has become a hot topic in science – to EcoHealth’s benefit – and the expertise on integrative research approaches is growing rapidly. National research bodies have initiated projects that compile best-practice approaches for doing transdisciplinary research in the USA (NAS, 2005) or in Europe (Pohl and Hirsch Hadorn, 2007). Also, methods are now available to manage complex research projects, facilitate interdisciplinary group work, establish new institutional structures for implementing transdisciplinarity at universities, or to evaluate the quality of transdisciplinary research. Such information can be found on the webpages of the transdisciplinarity-net of the Swiss Academies of Arts and Sciences (<http://www.transdisciplinarity.net>) or the Integration and Implementation Sciences Network at the Australian National University (<http://www.anu.edu.au/iisn/>). In spite of this growing interest and knowledge of transdisciplinarity, actual transdisciplinary research in particular thematic fields is scarce (Kueffer et al., 2007). As one of science’s most promising transdisciplinary journals, EcoHealth is poised to make an important contribution changing this situation. Simultaneously, we anticipate the journal’s evolution will reflect the steady growth in new and innovative ecohealth research and practice reflected by increased understanding of transdisciplinarity.

Bruce Wilcox, Editor-in-Chief

Asia-Pacific Institute for Tropical
Medicine and Infectious Diseases
University of Hawaii, Honolulu 96813, USA
e-mail: bwilcox@hawaii.edu

Christoph Kueffer

Transdisciplinarity-net

Swiss Academies of Arts and Sciences, CH-3007 Bern,
Switzerland

Department of Botany

University of Hawaii, Honolulu, HI 96822, USA

REFERENCES

- Bradley DJ (2004) An Exploration of Chronotones: A Concept for Understanding the Health Processes of Changing Ecosystems. *EcoHealth* 1(2):165–171
- Goy J, Waltner-Toews D (2005) Improving Health in Ucayali, Peru: A Multisector and Multilevel Analysis. *EcoHealth* 2(1):47–57
- Higginbotham N, Connor L, Albrecht G, Freeman S, Agho K (2006) Validation of an Environmental Distress Scale. *EcoHealth* 3(4):245–254
- Johnston FH, Jacups SP, Vickery AJ, Bowman DMJS (2007) EcoHealth and Aboriginal Testimony of the Nexus between Human Health and Place. *EcoHealth* 4(4):489–499
- Kueffer C, Hirsch Hadorn G, Bammer G, van Kerkhoff L, Pohl C (2007) Towards a publication culture in transdisciplinary research. *GAIA* 16:22–26
- NAS (National Academy of Sciences) NAE (National Academy of Engineering) IOM (Institute of Medicine of the National Academies) (2005) *Facilitating interdisciplinary research*. Washington, D. C: National Academies Press
- Pesek TJ, Helton LR, Nair M (2006) Healing across Cultures: Learning from Traditions. *EcoHealth* 3(2):114–118
- Pohl C, Hirsch Hadorn G (2007) *Principles for designing transdisciplinary research*. Munich, Germany, Oekom
- Robins L (2007) Capacity-Building for Natural Resource Management: Lessons from the Health Sector. *EcoHealth* 4(3):247–263
- Wahbe TR, Jovel EM, Silva García DR, Pilco Llagcha VE, Rose Point N (2007) Building International Indigenous People's Partnerships for Community-Driven Health Initiatives. *EcoHealth* 4(4):472–488
- Waltner-Toews D, Daszak P (2007) When Science meets Advocacy. *EcoHealth* 4(1):1–2
- Wilcox BA, Aguirre AA, Daszak P, Horwitz P, Martens P, Parkes M, Patz JA, Waltner-Toews D (2004a) EcoHealth: A Transdisciplinary Imperative for a Sustainable Future. *EcoHealth* 1(1):3–5
- Wilcox BA, Aguirre AA, Daszak P, Horwitz P, Howard J, Lanigan R, Martens P, Parkes M, Patz JA, Rapport D, Waltner-Toews D (2004b) EcoHealth: A Transdisciplinary Imperative for a Sustainable Future. *EcoHealth* 1(1):1–2

Published online: February 28, 2008