



International Human Dimensions Programme on Global Environmental Change (IHDP)

Introduction

By means of its multi-disciplinary teams of scientists and its integrated, long-term research on cutting-edge themes, IHDP is at the forefront of mobilizing and integrating social science research to the largely natural sciences-dominated GEC debate. Thereby, it effectively addresses the drivers of, impacts on and potential responses to Global Changes, including Climate Change. The recent activities and achievements of IHDP and its projects are outlined hereafter.

Science Highlights

Earth system governance, policy interaction

The earth system governance research has produced findings on a wide range of topics, ranging from the role of side-events in climate change negotiations to the political influence of the IPCC, the governance implications of the concept of planetary boundaries, and the governance of REDD+. ESG also contributed to its main goal of exploring political solutions and novel, more effective governance systems to cope with global environmental change through the accomplishment of various activities, publications and science-policy interaction. Successful events, such as the open-science conference in Colorado and the Policy Assessment in support of the Rio+20 conference, significantly enhanced ESG's global network of partner institutions and researchers. One of the project's highlights was recent accomplishment of a policy assessment with key policy recommendations regarding the institutional framework for sustainable development as well as a recent publication in *Science* arguing for fundamental reforms of global environmental governance and drawing from the assessment.

Biermann, Frank, Kenneth Abbott, Steinar Andresen, Karin Bäckstrand, Steven Bernstein, Michele M. Betsill, Harriet Bulkeley, Benjamin Cashore, Jennifer Clapp, Carl Folke, Aarti Gupta, Joyeeta Gupta, Peter M. Haas, Andrew Jordan, Norichika Kanie, Tatiana Kluvánková-Oravská, Louis Lebel, Diana Liverman, James Meadowcroft, Ronald B. Mitchell, Peter Newell, Sebastian Oberthür, Lennart Olsson, Philipp Pattberg, Roberto Sánchez-Rodríguez, Heike Schroeder, Arild Underdal, Susana Camargo Vieira, Coleen Vogel, Oran R. Young. 2011. *Transforming Governance and Institutions for a Planet under Pressure. Revitalizing the Institutional Framework for Global Sustainability: Key Insights from Social Science Research. Planet under Pressure Policy Brief, 3.*

Modern lessons in sustainability from the ancient Maya

IHOPE encourages the testing of human/environment system models against the integrated history to explore options for the future of humanity. In a particular research activity iHOPE draws conclusions regarding the capacity to cope with climate change and other challenges in modern tropical cities, by investigating the experiences of past societies, such as the Maya of Central America. Modern cities in developing countries, particularly in tropical regions, are experiencing unprecedented population growth and encountering strain on water, food and energy resources. With climate change and increasing energy costs, these cities are poised to either fail to adapt to

changing conditions, or will continue to maintain themselves drawing on resilient social-ecological support systems. iHOPE gains insight into the fate of modern tropical cities by examining resilience of past societies such as the Maya.

S. Van der Leeuw, S., R. Costanza, S. Aulenbach, S. Brewer, M. Burek, S. Cornell, C. L. Crumley, J. A. Dearing, C. Downy, L. J. Graumlich, S. Heckbert, M. Hegmon, K. Hibbard, S. T. Jackson, I. Kubiszewski, P. Sinclair, S. Sörlin, and W. Steffen. 2011 Toward an integrated history to guide the future. *Ecology and Society* 16(4):2.

Urbanization, climate change adaptation

UGEC continued its focus on climate change adaptation in urban areas and developed essential research findings in this context during the past year. Besides the organization of a training workshop on 'Urban Responses to Climate Change in Asia', held in Taiwan, UGEC also conducted studies in this field and generated essential findings. One major research result shows that disaster risk reduction and climate change adaptation converge and interplay in the context of urban areas. The awareness of these connections started to change how researchers and practitioners conceive and approach the analysis and management of urban climate risk and associated impacts and response activities.

Rosenzweig, C., Solecki, W.D., Hammer, S., Mehrotra, S. (Eds.) (2011). *Climate change and cities: First assessment report of the Urban Climate Change Research Network*. New York, NY: Cambridge University Press.

Climate change risks and risk governance

Working on the topics of Extreme Risks and Vulnerability & Adaptation the IRG-Project combines a multi-institutional, interdisciplinary team of natural scientists, social scientists, engineers, policy makers as well educators around the world who develop and apply theoretic, mathematic and computational tools for the decision making processes in the case of large-scale disasters around the globe. For this purpose the project developed eleven new initiatives in 2011, including a workshop for science policy interaction on 'Climate Change Risks, Low-carbon Society and Green Development' that was conducted in Nanjing, China.

Global Land Project

GLP started preparing its synthesis phase and continued its cooperation with IHDP's core project UGEC. Following the jointly organized International Conferences of GLP and UGEC, which focused on the linkage between urbanization, land and landscapes, and climate change, both projects worked together in a joint workshop in 2011, discussing and developing a vision for a new conceptual framework of urban-land teleconnections that would enable a novel approach to local-to-global-scale land use change processes. Among many other results, a major outcome of the 2010 GLP conference was published in the journal *Science* in November 2011 discussing the topic of ecosystem services.

Kinzig, A.P., Perrings, C., Chapin III, F.S., Polasky, S., Smith, V.K., Tilman, D. and Turner II, B.L., 2011. Paying for Ecosystem Services – Promise and Peril. *Science*, Vol.334, no.6056, pp.603-604. DOI: 10.1126/science.1210297

Inclusive Wealth Report

Unless the yardsticks which society uses to evaluate progress are changed, the continued downward spiral of the planet's natural systems will continue. Traditional indicators such as GDP and HDI have basic limitations as measures of social progress. Neither GDP/capita nor HDI reflect the state of the natural environment and both focus on the short term, with no indication of whether current well-being can be sustained. In this context, a prominent indicator for addressing the weaknesses in contemporary measures is 'Wealth' that relies on the stocks of different assets:

Natural, Manufactured, and Human Capital. The Inclusive Wealth Report (IWR) features Inclusive Wealth as a comprehensive measure to track societal well-being.

The IWR is a United Nations University International Human Dimensions Programme on Global Environmental Change (UNU-IHDP) initiative with support from the United Nations Environment Programme (UNEP), in collaboration with the UN-Water Decade Programme on Capacity Development (UNW-DPC) and the Natural Capital Project, Stanford University. The project aims at developing the first report on the wealth and changes in the wealth of nations, with a particular focus on Natural Capital. In the long-term, the project aims at producing a series of IWR's on a biennial basis. The first Inclusive Wealth Report will focus on a selection of 20 countries worldwide, with a special emphasis on developing countries, covering the 1990-2008 time period. It will be launched at the Rio+20 conference in 2012.

Assessment of human drivers of and responses to global environmental change

The Social Sciences and Humanities Assessment of Global Change is an international process that will provide policymakers and the public with "state of the art" scientific information on the behavioral and cultural drivers of global environmental change, as well as likely and preferred behavioral and cultural responses. It seeks to outline best practices for the social, cultural economic and political transition to sustainability by improving the information available for decisions and by informing and inspiring relevant stakeholders to press for necessary change. The Assessment will be guided by key questions identified through a participatory process with policymakers within governments and international conventions, and users within the academic and business communities and civil society.

The Assessment will be undertaken at multiple levels, including a global Social Science Assessment Panel, and regional coordination nodes bringing together regional scientists to conduct assessments using scientific literature from that region. And, while the Assessment will directly respond to the demand and information needs of governments and conventions, it will also place major emphasis on communication to business and civil society in recognition that these actors are as influential as governments in causing change. The Assessment will be undertaken by a global network of some 500+ social scientists and humanities scholars in collaboration with interdisciplinary environmental change researchers. IHDP will administratively support it.

Climate Change Research, Including Marine Research, on Technical and Scientific Aspects of Greenhouse Gas Emissions and Removals from Coastal and Marine Ecosystems

IHDP's core project LOICZ is working to support sustainability and adaptation to global change in the coastal zone. LOICZ supports adaptation to global change by linking natural and social sciences with knowledge of coastal communities at global, regional and local scales. The project's research in 2011 led to the identification of key coastal syndromes and appropriate responses. Of research interest were geographic hotspots of coastal vulnerability encompass the Arctic, small islands, river mouth systems, deltas and estuaries and urbanized coasts. A first status report of rapidly changing Arctic coasts has been published and the DPSIR framework was applied to coastal megacities.

Major findings of LOICZ coastal zone research included the worldwide decline of seagrass habitat and biodiversity. It also showed that changing material transfers along the continent-ocean interface in Brazilian rivers can be attributed to land use changes and global climate change. A further research activity of the project is the IGBP synthesis on Coastal Megacities. The analysis

comprises impacts of megacities on coastal ecosystem goods and services, and welfare. It explores global change pressures, geo risks and opportunities for sustainable development.

Newton, A., Carruthers, T.J.B. & Icely, J. (2011): The coastal syndromes and hotspots on the coast. *Estuarine Coastal and Shelf Science* 96(1): 39-47. DOI information: <http://dx.doi.org/10.1016/j.ecss.2011.07.012>.

Howarth, R.W., Swaney, D.P. Billen, G. Garnier, J. Hong, B. Humborg, C. Johnes, P. Mörth, C.-M. and Marino, R.M. (2011). Nitrogen Fluxes from Large Watersheds to Coastal Ecosystems Controlled by Net Anthropogenic Nitrogen Inputs and Climate. *Frontiers in Ecology and the Environment*. DOI information: <http://10.1890/100178>.

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