

Exploring Potential Impacts of Climate Change and Deforestation on the Planning and Operation of Hydropower Plants

Brasília, Brazil – May, 6-7, 2013

Organizers: Paul Moorcroft and John Briscoe, Harvard University

Host institution: Autoridade Nacional da Agua

How are potential impacts of climate change and deforestation being factored in the planning and operation of hydropower plants in the Amazon? The *Sustainable Science Program's Initiative on the Sustainable Development of the Amazon* is examining the linkages between land use decisions in Brazil and their impacts on climate and water availability within the Amazon and surrounding regions. Agricultural expansion and other land use transformation is continuing in the Amazon as global demand for food and biofuel increases and regional economies expand. Professors Paul Moorcroft (Biology) and John Briscoe (HKS and SEAS) convened a workshop in Brasilia in May 2013 to explore the potential impacts of climate change and deforestation on the planning and operation of hydropower plants. They presented their research, in which they link the predictions of hydrologic change from a coupled biosphere-atmosphere model to river hydrology models used to assess hydropower implications of changes in patterns of precipitation, runoff and evapotranspiration. They sought guidance to maximize the significance and relevance of the model simulations to hydropower management agencies. Meeting participants included key institutions in the hydropower sector, including ANA (National Water Authority), MMA (Environment Ministry), MMA (Science and Technology Ministry), EPE (Energy Planning Company), the power company Odebrecht, the construction company ENERSUL, as well as the World Bank, the Nature Conservancy, and the World Wildlife Fund.

Harvard Team

Paul Moorcroft, Professor of Organismic and Evolutionary Biology, Department of Organismic and Evolutionary Biology, Harvard University

John Briscoe, Professor of the Practice of Environmental Engineering, Harvard University

Eunjee Lee, Giorgio Ruffolo Post-doctoral Research Fellow, Department of Organismic and Evolutionary Biology, Harvard University

Angela Livino, Giorgio Ruffolo Doctoral Research Fellow, School of Engineering and Applied Sciences, Harvard University

Program

Opening

- Welcome by MMA, MME and ANA
- Sustainable development of the Amazon and its surrounding regions: The interplay of changing climate, hydrology, and landuse impacts on hydropower planning and operation (Moorcroft and Briscoe) [[slides](#)]
- Framework of Harvard models: A case study of the Parana River Basin (Livino) [[slides](#)]

Detailed discussions on key topics, including the modeling framework, data, and initial results for the hydropower sector

Response and suggestions from key stakeholders:

- Group One – Government
- Group Two – energy operators

- Group Three – scientists and academia

Discussion and conclusions:

Implications for hydropower: A case study of the Tapajós river basin [[slides](#)]

Concluding remarks

Participants

Bruno Collischonn, Autoridade Nacional da Agua (ANA) - Brazil's national water authority

Carlos Motta Nunes, ANA

Flavio Troger, ANA

João Lotufo, ANA

Ligia Araujo, ANA

Marcio Nobrega, ANA

Mauricio Andres, ANA

Patrick Thomas, ANA

Pedro Cunha, ANA

Sergio Ayrimoraes, ANA

Jerson Kelman, Empresa Energetica de Mato Grosso do Sul SA (ENERSUL) - engaged in distribution of electric energy in the state of Mato Grosso do Sul

Gustavo Schimmit, Empresa de Pesquisa Energetica (EPE), Brazil's agency for power planning

Paula Coutinho, EPE

Thais Iguchi, EPE

Thiago Ferreira, EPE

Angela Livino, Harvard Univerisity

Eunjee Lee, Harvard

John Briecoe, Harvard

Paul Moorcroft, Harvard

Sanderson Leitão, Ministério da Ciência e Tecnologia - Brazil's Ministry of Science and Technology

Ana Lucia Dolabella, Ministério do Meio Ambiente (MMA) - Brazil's Ministry of Environment

Ariel Pares, MMA

Bianca Mattos, MMA

Carlos Klink, MMA

Mauricio dos Santos, MMA

Tarcisio Nunes, MMA

Luciana Lourenco, MMA

Gabriel Azevedo, Construtora Norberto Odebrecht - engineering and construction company

Eduardo Franca, Operador Nacional do Sistema Eletrico (ONS) - Electric System National Operator

Ana Cristina Barros, The Nature Conservancy (TNC)

Edenise Garcia, TNC

Leandro Baumgarten, TNC

Maria Ines Persechini, World Bank

Pedro Bara Neto, World Wildlife Fund