

Impacts of Water Resource Management Choices in Ceara, Brazil:

Roles of Streamflow Forecasts, Rainfall Forecasts and Participatory Decision Making

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Abstract

We propose to analyze the impacts of shifts in water resource management in Ceara, NE Brazil, emphasizing the variation in benefits and costs across the suite of stakeholders who are affected, and focusing on the potential roles for climate information and for participatory decision making. Specifically, we propose to study impacts in the Jaguaribe and Metropolitan basins, the largest and most populated water basins in this state and areas prone to recurrent, multi-year droughts. These basins contain a wide range of stakeholder types who are affected differently by policies. Understanding how proposed shifts in water allocation and reservoir system operation may affect these users over a spectrum of scenarios is critical for formulating equitable and efficient policy. We will work jointly with relevant local policy makers to develop and test decision support tools.

Three specific types of recently considered policies will receive the bulk of analytical attention: Policy 1) basing reservoir releases upon streamflow forecasts based upon climate information; Policy 2) providing improved seasonal-to-interannual precipitation forecasts to all water users; Policy 3) changing the role of participatory water allocation seminars in the release decisions.

Using ethnographic and survey methods, analysis of existing data sets, quantitative inference and modeling, and finally, envisioning tools, we propose to address the following guiding questions:

- What are gains from basing releases upon seasonal-to-interannual streamflow forecasts, how are gains distributed across stakeholders and who, if anyone, faces increased risk?
- How do historical uncertainty and current climate forecasts affect production decisions?
- What roles do stakeholders play in release choices through water allocation seminars and how could agency scenarios and rainfall forecasts affect consensus and actors' choices?
- For agencies to evaluate water management options, e.g. use of forecasts or water rights, which form and content of scenario simulations best support actual decision processes?