

Session 2A: Climate Change and Efficiency of Water Supply and Use

Rapporteur's Summary

**11th Annual Meeting of the
International Water Resource Economics Consortium (IWREC)
EFFICIENCY AND WATER CONSERVATION: METHODOLOGIES AND CASE STUDIES
World Bank, Washington, DC, September 7-9, 2014**

Measuring Vulnerability of Rural Households to Climate Stress in Niger by Econometric and Indicator Methods

Elhadji Iro Illa (Cheikh Anta Diop University of Dakar, Senegal)

- Principal Components Analysis (PCA) used to analyze the probability that rural households in Niger will fall below the poverty line due to climate shocks
- Paper focuses on the resilience of rural households to exogenous shocks, including climate stress, as the net effect of (i) exposure, (ii) sensitivity, and (iii) adaptive capacity
- Approach confirms sensitivity of many rural households to climate stress
- Relevance for policy makers: Regional differences detected in vulnerability patterns

Optimal Climate Change Adaptation in the Water Sector

Anke D. Leroux (Monash University, Caulfield, Australia)
and Vance L. Martin (University of Melbourne, Australia)

- Dynamic stochastic optimization model used to assess effects of climate change on the optimal composition of an urban water portfolio (Melbourne)
- Three alternative sources of water considered: reservoir water, harvested rainwater, manufactured water
- Key result is that optimal climate change adaptation under a wide range of climate projections involves only marginal changes to the long-run optimal mix of water sources
- Model suggests that substantial water savings on the demand side are necessary in a drying climate; the greatest adaptation challenge to climate change will be to reduce annual water consumption to a level that reflects the greater scarcity of natural water

Water Use and Conservation in Manufacturing: Evidence from U.S. Microdata

Randy A. Becker (U.S. Census Bureau, Washington, DC, United States)

- Paper examines water use and water conservation in the U.S. manufacturing sector (industrial use not often studied due to data availability problems)
- Focus on the factors behind manufacturers' decision to recirculate water and how much to recirculate
- Key feature of manufacturing: the possibility to recirculate water -- reduces the need for new intake, which could generate enormous savings
- Paper sheds light on the decision-making process within firms of different sizes and types – potentially very useful as climate change reduces water availability

Efficient Water Management Policies for Climate Change Adaptation in the Jucar Basin, Spain

*Mohamed Taher Kahil (Agrifood Research and Technology Center, Aragon, Spain),
Ariel Dinar (University of California, Riverside, CA, United States), and
Jose Albiac (Agrifood Research and Technology Center, Aragon, Spain)*

- Integrated hydro-economic model used to analyze alternative drought management policies in the Jucar Basin of Spain under three climate scenarios
- One key result is that droughts have large welfare impacts, with the main adjustments sustained by irrigation activities and the environment
- Use of private water markets (trading) can increase benefits, but positive environmental externalities are likely to be ignored
- Results confirm there are advantages to using negotiation and stakeholders' cooperation to allocate water among users -- allows balancing of economic and environmental objectives