

Authors

Michael Kremer
The University of Chicago

Jessica Leino
Stanford University

Edward Miguel
University of California, Berkeley
Center for Effective Global Action (CEGA)

Alix Zwane
Global Innovation Fund

SPRING CLEANING: RURAL WATER IMPACTS, VALUATION, AND PROPERTY RIGHTS INSTITUTIONS*

MICHAEL KREMER
JESSICA LEINO
EDWARD MIGUEL
ALIX PETERSON ZWANE

Using a randomized evaluation in Kenya, we measure health impacts of spring protection, an investment that improves source water quality. We also estimate households' valuation of spring protection and simulate the welfare impacts of alternatives to the current system of common property rights in water, which limits incentives for private investment. Spring infrastructure investments reduce fecal contamination by 66%, but household water quality improves less, due to contamination. Child diarrhea falls by one quarter. Two-stage least squares preference estimates of households' valuations are much smaller than both stated preference valuations and health planners' valuations, and are consistent with models in which the demand for health is highly income elastic. We estimate that private property norms would generate little additional investment while imposing large static costs due to above-marginal-net pricing; private property would function better at higher income levels or under water scarcity, and alternative institutions could yield Pareto improvements. *JEE*. Codes: C93, H75, O13, Q25, Q51.

I. INTRODUCTION

Movement toward private property rights institutions has been called critical to successful economic development (De Soto 1989; North 1990). Yet social norms and formal laws often create communal property rights in natural resources. In Islamic law, for

*This research is supported by the Hewlett Foundation, USAID/Foreign Agricultural Service, International Child Support, Swedish International Development Agency, Finnish Fund for Local Cooperation in Kenya, google.org, the Bill and Melinda Gates Foundation, and the Sustainability Science Initiative at the Harvard Center for International Development. We thank Alecia Banton, Jeff Borras, Lorenzo Caschieri, Carmen Dominguez, Willa Friedman, Francois Gerard, Anne Hoady, Jonas Hjort, Jo Ma, Clair Null, Owen Omer, Camille Parnes, Changhong Song, Eric Van Dusen, Melorie Wasserman, and Heili Williams for excellent research assistance, and we thank the field staff, especially Polycarp Wamwa and Leonard Bukoko. Jack Coffard, Alain de Jonckheere, Giacomo DiGiorgi, Esther Duflo, Pascaline Dupas, Liron Elnar, Andrew Foster, Michael Gremmen, Arno Greif, Michael Henkens, Duncan Inyang, Ethan Ligon, Steve Luby, Chack Maroli, Enrico Morini, Kara Nelson, Aris Novo, Sheila Omatood, Ariel Pakes, Judy Peterson, Pascaline Dupas, Bob Quick, Mark Rosenzweig, Elizabeth Sadoulet, Sandra Spence, Duncan Thomas, Ken Train, Chris Udry, Dale Whittington, and many seminar participants have provided helpful comments. Opinions presented here are those of the authors and not those of the Bill & Melinda Gates Foundation or the World Bank. All errors are our own.

© The Author(s) 2011. Published by Oxford University Press, on behalf of President and Fellows of Harvard College. All rights reserved. For Permissions, please email: journals.permissions@oup.com.
The Quarterly Journal of Economics (2011) 126, 145–205. doi:10.1093/qje/qjz010.

Spring Cleaning: Rural Water Impacts, Valuation, and Institutions

Using a randomized evaluation in Kenya, we measure health impacts of spring protection, an investment that improves source water quality. We also estimate households' valuation of spring protection and simulate the welfare impacts of alternatives to the current system of common property rights in water, which limits incentives for private investment. Spring infrastructure investments reduce fecal contamination by 66%, but household water quality

improves less, due to recontamination. Child diarrhea falls by one quarter. Travel-cost based revealed preference estimates of households' valuations are much smaller than both stated preference valuations and health planners' valuations, and are consistent with models in which the demand for health is highly income elastic. We estimate that private property norms would generate little additional investment while imposing large static costs due to above-marginal-cost pricing, private property would function better at higher income levels or under water scarcity, and alternative institutions could yield Pareto improvements. JEL Codes: C93, H75, O13, Q25, Q51.

March 27, 2015