Brian Thiede
Cornell University
PAA 2013

Environmental Shocks and Inequality: Evidence from Ethiopia

Research on the social and economic impact of environmental change has proliferated in recent years, particularly in the context of increasing concern about global climate change (Adamo and Izazola 2010, Adger 1999, Black et al. 2011, Cutter et al. 2003). Studies have examined the impact of environmental change on migration (Gray and Mueller 2012, Massey et al. 2010), poverty (Dercon et al. 2005, Little et al. 2006), and livelihood strategies (Corbett 1988, De Wall 2005, Roncoli et al. 2001). This research shows that social factors mediate the impact of environmental change, and demonstrates that individuals and households face constraints, but also exercise agency within contexts of environmental change.

However, this research has focused almost exclusively at the individual and household levels, thereby neglecting the impact of environmental change on the distribution of resources. The few studies that have examined the distributional consequences of environmental change (Fratkin and Roth 1990, Reardon and Taylor 1996, Valentine 1993) have considered only income or single classes of assets, and employed extremely limited empirical strategies. As such, knowledge of the relationship between environmental change and inequality remains negligible.

This paper begins to fill this gap using data from the 1999, 2004, and 2009 Ethiopian Rural Household Surveys (ERHS). First fielded in 1989, the ERHS is a unique longitudinal study conducted by the International Food Policy Research Institute (IFPRI), Oxford University, and Addis Ababa University. It currently covers 1,477 households in

fifteen rural villages in Ethiopia, and includes extensive information about household income, assets, land holdings, and exposure to environmental shocks.

Using the ERHS, this paper estimates intra-village inequality indices (e.g. Gini, coefficient of variation) for income, assets, and land in each of the fifteen ERHS villages in 1999, 2004, and 2009. After calculating changes in inequality during all intervals of time, t to $t+n$, I compare changes in inequality for villages exposed to drought within three years of time $t+n$ (a quasi-treatment group) to changes for villages that were not (a quasi-control group). Using decomposition techniques, I then explore how changes in inequality within and between key demographic groups, and within asset and income classes, contribute to differences in overall changes between 'treatment' and 'control' groups. Finally, I use multi-level regression models to identify the household- and community-level factors that affect the probability of households' upward (downward) socioeconomic mobility.

The findings in this paper will provide insight into the heterogeneous impact of drought and the overall implications of such environmental changes for social inequality.

References

Adamo, Susana B. and Haydea Izazola. 2010. "Human migration and the environment." *Population and Environment* 2-3: 105-108.

Adger, W. Neil. 1999. "Social Vulnerability to Climate Change and Extremes in Coastal Vietnam." *World Development* 27: 249-269.

Black, Richard, W. Neil Adger, Niger W. Arnell, Stefan Dercon, Andrew Geddes, and David S.G. Thomas. 2011. "The effect of environmental change on human migration." *Global Environmental Change* 21S: S3-S11.

Corbett, Jane 1988. "Famine and Household Coping Strategies." *World Development* 16: 1099-1112.

Cutter, Susan L., Bryan J. Boruff, and W. Lynn Shirley. 2003. "Social Vulnerability to Environmental Hazards." *Social Science Quarterly* 84: 242-261

De Waal, Alex. 2005. *Famine that Kills: Darfur, Sudan*. New York: Oxford University Press.

Dercon, Stefan, John Hoddinott, and Tassew Woldehanna. 2005. "Shocks and Consumption in 15 Ethiopian Villages, 1999-2004." *Journal of African Economies* 14: 559-585.

Ethiopia Rural Household Survey Dataset, 1989-2009. 2011. Washington, D.C.: International Food Policy Research Institute (IFPRI).

Fratkin, Elliot and Eric A. Roth. 1990. "Drought and Economic Differentiation Among Ariaal Pastoralists of Kenya." *Human Ecology* 18: 385- 402.

Gray, Clark. 2009. "Environment, Land, and Rural Out-migration in the Southern Ecuadorian Andes." *World Development* 37: 457-468.

Gray, Clark and Valerie Mueller. 2012. "Drought and Population Mobility in Rural Ethiopia." *World Development* 40: 134-45.

Little, Peter D., M. Priscilla Stone, Tewodaj Mogues, A. Peter Castro, and Workneh Negatu. 2006. "Moving in Place: Drought and Poverty Dynamics in South Wollo, Ethiopia." *Journal of Development Studies* 42: 200-225.

Massey, Douglas S., William G. Axinn, and Dirgha J. Ghimire. 2010. "Environmental change and out-migration: evidence from Nepal." *Population and Environment* 23: 109-136.

Reardon, Thomas and J. Edward Taylor. 1996. "Agroclimatic Shock, Income Inequality, and Poverty: Evidence from Burkina Faso." *World Development* 24: 901-14.

Roncoli, Carla, Keith Ingram, and Paul Kirshen. 2001. "The costs and risks of coping with drought: livelihood impacts and farmers' responses in Burkina Faso." *Climate Research* 19: 119-132.