

Impact Evaluation of Environmental Outcomes

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Impact evaluation (IE) is relevant for the environment

- IE is a tool to estimate attributable “treatment effects”
 - Especially relevant when behavior conditions outcomes of interest
- Many environmental issues may initially appear to be mostly matters of biophysical science
 - End of pipe measures to reduce pollution
- However, many unknown behavioral assumptions underpin environmental programming
 - Will there be compliance with a regulation?
 - Will incentives change behavior as expected?
- There are also environmental implications of behavioral responses to non-environmental policies
- And the long term effects of environmental impacts depend on behavioral responses

Challenges in IE of environment interventions

- “Environment” can be complex dependent variable
 - Difficult to measure
 - High data collection cost where can be measured
- Many environmental programs are not implemented so as to allow enough observations for statistical power
 - Small scale, clustered projects
 - National policies
- General equilibrium effects may condition responses
- Long lags, many effects only visible in future
- Requires creative solutions – a few experiences discussed here that could identify effects

Mixed methods approach

- Question: What is the impact of policy research on deforestation?
- Approach (Center for International Forestry Research)
 - Theory of change approach to causality from research to policy change
 - Key informant interviews
 - Triangulated by citation analysis
 - Interrupted time series (econometric test of trend break) to confirm change in proximate variable (conservation set asides) at time of policy reform
 - Modeling of conservation set aside effects

“New data” and structural approaches

- ADB in collaboration with Gov't of Myanmar
- Question – what is the effect of agricultural concession allocation on deforestation in Myanmar?
- Approach
 - Use remote sensing estimates of land cover changes (dependent variable)
 - Spatially disaggregated data on alternative drivers
 - Fixed effect (changes on changes) regression of regional/state statistics

Experiments that “instrument” environmental impacts

- IRRI w/ University of California, Berkeley
- Question – how does climatic risk (expected to increase under climate change) affect farmer behavior
 - Approach – find a way to reduce risk exposure, without affecting anything else
 - Created a randomized controlled trial using a single gene introgression of flood tolerance in the most widely adopted rice variety (Swarna) in Orissa, India
 - Observed changes in behavior/performance of treated farmers, relative to controls over time

Conclusions

- IE is both needed and possible on environmental programming and outcomes
- Indirect and general equilibrium effects pose the most difficulties to capture
 - However, often the most important mechanisms for environmental outcomes
- Requires creativity to evaluate empirically
 - Proxies for long term effects
 - Mixed methods, modeling
 - Structural approaches