DOCTOR OF PHILOSOPHY IN MANAGEMENT

ESSAYS ON ECONOMICS OF POOR ENVIRONMENT

By

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To my Wife...
for Inspiration, Support & Love.

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Acronyms

AOD Aerosol Optical Depth
CES Constant Elasticity of Substitution
CGWB Central Groundwater Board
CPCB Central Pollution Control Board
CRB Crop Residue Burning
DID Difference-in-Difference
IO Input Outpt
PM10 Particulate Matters of diameter 10 micro mts
PBLH Planetary Boundary Layer Height
RSPM Residual Suspended Particulate Matters
SOX Oxides of Sulfur
SSPA Sub-Soil Preservation Act
NOX Oxides of Nitrogen
NASA National Aeronautics and Space Administration
IAM Integrated Assessment Models
ICRISAT International Crops Research Institute for the Semi-Arid Tropics
VDSA Village Dynamics in South Asia

Abstract

The advent of environmental degradation due to air and water pollution, the decline in water table, and climate change have necessitated the design of mitigation and adaptation strategies that minimize the risk efficiently. Prior literature in environmental economics provides evidence on the local impact of adaptation and mitigation actions with minimal emphasis on their associated externality and general equilibrium effect. This thesis addresses these gaps in the literature in the following manner. First, I evaluated the non-localized externality of the groundwater regulation which was implemented in Punjab and Haryana. I find that the delay in crop residue burning due to the regulation increased the concentration of PM_{10} by 22 percent in Delhi. The observed impact is mediated through the change in wind direction and decline in temperature. Second, I analytically show that climate change adaptation in the agriculture sector through the demand of additional inputs impacts the aggregate social welfare. The additional inputs reduce the impact of productivity loss in the agriculture sector due to climate change on the aggregate social welfare. The significance of this thesis is that it informs our theoretical understanding of the general equilibrium effect of adaptation and empirical understanding of the non-localized externality of mitigation actions.

Keywords: Crop residue burning; Air Pollution; Non-Localized Externality; Climate Change; Climate Adaptation; Production Network