

# Foreword

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This special issue on “Environmental Regulation and Innovation in Local Communities” came out of the 2019 Northeastern Agricultural and Resource Economics Association’s Post-Conference Workshop. The workshop sought to invite a conversation among researchers, think tanks, government agencies, and policy makers to enhance our understanding of (1) how local communities innovate when shaping and responding to environmental regulations, and (2) how these environmental regulations affect rural communities’ economic well-being and environmental quality. This resulting special issue includes two invited pieces from the workshop’s keynote speakers, both leading scholars in the area of regulation or innovation and five manuscripts that deal with local environmental issues—issues that highlight geographically distinct environmental problems related to land use, water quality, and energy—each of which require different solutions. In various ways, these papers look at the linkages between economic and environmental objectives that define the location-specificity of the environmental issue at hand and the requisite policy solutions.

Segerson (2020) provides context to disparate local environmental regulations by discussing how interjurisdictional spillovers versus spatial heterogeneity give rise to arguments favoring either federal versus local control over regulations. To offer innovation as a solution, Popp (2020) provides the general lessons from energy-related innovation and applies them to local jurisdictions to promote not just diffusion or deployment of innovations but also development of new technologies. Their pieces jointly touch on the dual approach for environmental protection to address the simultaneous market failures from negative externalities from pollution and positive knowledge externalities from innovation. The five manuscripts in this volume are in line with specific themes from these pieces.

That many local environmental policies generate purely local goods or impure public goods provides the basis for why local jurisdictions consider undertaking costly environmental measures as opposed to ceding control to the federal

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government (Segerson 2020). For example, the benefits of water quality improvements from adoption of best management practice (BMP) are local, justifying subsidization of BMPs, as examined in Yehouenou et al. (2020). On the other hand, the local benefits (in Tennessee) in the form of ecosystem services may be substantial enough to justify allocating funds to acquire land for carbon storage, as described in Sharma et al. (2020). Moreover, farmers' preference to contract with the state (Florida) agricultural agency over a federal agricultural agency speaks to the desire for local control (Yehouenou et al. 2020). Interestingly, the preference for federal agricultural agency over state environmental agency (as in Yehouenou et al. 2020) may be a reflection of the preference for contracting partners whose focus is on the private benefits for farmers (cost-sharing) as opposed to an environmental agency that may be perceived as being more concerned with public environmental benefits.

Beyond the interjurisdictional spillovers and the extent of local versus external benefits is the issue of spatial heterogeneity in local economic and environmental conditions that are crucial to policy design. Sharma et al. (2020) demonstrate that because land acquisition costs vary by region according to land use patterns and economic growth projections, Pareto optimal budget allocations to conserve land for carbon storage should also vary across locations. Heterogeneity in the composition of economic agents (farmers) who differ in their propensity to adopt BMPs and in the spillovers effects of their adoption decisions implies that the cost-effective targeting strategy for subsidization of BMPs can be expected to vary across regions as well (Liu and Ruebeck 2020).

Location-specific conditions also play a role in explaining the violations of public versus privately owned public water systems (PWSs) because public and privately owned PWSs have different incentive structures that partly rely on the degree to which each prioritizes public accountability (Fu et al. 2020). Finally, for the case of energy, spatial heterogeneity in the availability of renewable energy also means that the degree of intermittency varies across states. Because the elasticity of substitution between renewable and fossil fuels rises with intermittency, Aleti and Hochman's (2020) findings imply that the efficacy and welfare impacts of carbon taxes and renewable subsidies will also vary across regions.

Solutions to local environmental problems directly require an expenditure outlay to acquire land (Sharma et al. 2020), subsidize BMPs (Yehouenou et al. 2020; Liu and Ruebeck 2020), fund PWSs (Fu et al. 2020), or invest in renewable energy technologies (Aleti and Hochman 2020). The allocation of funding or targeting for subsidies or taxes would vary spatially due to various location-specific environmental and economic factors, and it is in this area that Segerson (2020) asserts that the local jurisdictions' power and responsibility may also lie, not just in policy design.

Key to both Segerson's and Popp's arguments is the need for coordination and integration. Specifically applying Popp's (2020) lessons to Aleti and Hochman's

(2020) findings suggests that despite geographical differences in the intermittency of renewables and in the welfare burden of environmental and technology policies, we cannot rely on states or local jurisdictions to undertake research on renewable energy technology independently or unilaterally. Popp (2020) suggests that coordination of both policy targets to increase the overall market size of such technologies and coordination in R&D to diversify risk and avoid duplication of efforts are necessary. Further, the success of demand-side but not supply-side policies to promote technology transfer beyond the boundaries of where development takes place may be a key consideration when viewing Aleti and Hochman's (2020) policy recommendations. These lessons on market scale, demand-side approach, and coordination potentially have wide-ranging implications for innovation-based solutions to other local environmental problems. However, in cases when states compete with each other because of environmental leakages, interjurisdiction economic impacts, or truly global environmental problems such as climate change, effective and efficient solutions would require a portfolio of well-integrated policies at the national and sub-national levels (Segerson 2020).

## Funding Statement

The NAREA 2019 Post-Conference Workshop organizers would like to acknowledge funding from the National Institute of Food and Agriculture (NIFA), Agricultural and Food Research Initiative (AFRI), Innovation for Rural Entrepreneurs and Communities Priority Area of the Agriculture Economics and Rural Communities (AERC) Program, GRANT 12686216.

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