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Evaluating the use of an environmental assurance program to address pollution from United States cropland

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ABSTRACT

Voluntary market-based programs have been proposed as cost-effective means to reduce environmental impacts associated with agriculture. This study examines a relatively new program in Michigan USA, the Michigan Agriculture Environmental Assurance Program (MAEAP), and explores how it might serve to reduce nutrient pollution associated with intensive corn production. Interviews with corn farmers were used to explore reasons for program participation, the extent of management changes, and opinions regarding program effectiveness. Results indicate that most farmers enrolled in the program had already satisfied the majority of the requirements, therefore few changes were made that would result in environmental improvements. Interviews also revealed that in almost all cases, corn farmers were unable to market their products as MAEAP verified. Participation was largely driven by goals to avoid law enforcement and minor financial benefits through insurance discounts. Farmers indicated that a lack of monitoring and enforcement reduced the perceived effectiveness of the program. Most farmers favored direct payments through government conservation programs over MAEAP. This case illustrates the limitations of voluntary and market-based programs to address agri-environmental problems and supports the use of multiple policy approaches.

Introduction

Agricultural systems cover a third of global land area and are primarily managed to provide food, fuel, and fiber and meet the demands of the growing world population (Zhang et al., 2007). In addition to producing goods, agriculture has the potential to provide a suite of ecosystem services or disservices depending on management practices and input choices. Ecosystem services from agriculture can include carbon sequestration, enhanced soil fertility, biodiversity conservation, and cultural services like recreation and esthetics (Robertson and Swinton, 2005; Swinton et al., 2007; Zhang et al., 2007; Power, 2010; Lorencova et al., 2013). However, clear disservices linked to agriculture have also emerged such as water pollution, habitat loss, and human health risks. In the United States (US), intensive agricultural production, using high levels of chemical inputs, remains one of the primary causes of water pollution, greenhouse gas emissions, and wildlife species endangerment (Howarth et al., 2002; Rabalais et al., 2002; Ribaudo and Johansson, 2006; Kerr and Deguise, 2004; Robertson et al., 2013).

Despite persistent environmental problems associated with agricultural land use, agriculture has been largely excluded from environmental regulation in the US (Browne, 1988; Browne et al., 1992; Montpetit, 2002; Daugbjerg and Swinbank, 2008). Instead, the US government has supported incentive programs administered through the US Department of Agriculture (USDA) that provide cost-sharing and direct payments for the adoption of environmental practices. These programs continue to face budget constraints, limited effectiveness, and substantial criticism (Shortle et al., 2012). Market-based programs have also been developed to address pollution associated with US agriculture. These include environmental management systems and environmental assurance programs. Due to increasing federal budgetary constraints, these market-based approaches are receiving increased attention and support. While government may play a role in these programs, most are non-government based or represent collaborative efforts. These approaches to environmental governance in agriculture are not unique to the US: a number of programs have emerged and

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have been studied in Europe and Australia (e.g., Gunningham, 2007; Hamblin, 2009; Atwell et al., 2010; Cary and Roberts, 2011; Burton and Schwarz, 2013; Schroeder et al., 2013; Hodge and Reader, 2010; Moon, 2013; Lockie, 2013; Race and Curtis, 2013). While most studies indicate that these approaches should be used in conjunction with regulation and other government programs, certain policymakers in the US are pushing to reduce government involvement and rely more heavily on market-based programs.

Efforts to reduce the role of government in addressing agricultural pollution have emerged within a larger trend toward neoliberal governance since the 1980s (Harvey, 2005). Neoliberal governance in general involves both a "rollback" of government involvement as well as a "rollout" of responsibilities to non-government parties and "self-regulating" market mechanisms (Peck and Tickell, 2002). Neoliberal approaches have been touted as being more flexible and efficient. In food and agriculture, the state has increasingly supported market-based and voluntary approaches to governance (Pechlaner and Otero, 2008, 2010). There has been a "trend in rural and agricultural policy toward programs that seek to facilitate various forms of self-regulation, self-help, and entrepreneurialism" (Lockie and Higgins, 2007: 1). Often this means addressing social and environmental sustainability through means that bolster the economic sustainability of agriculture (a win–win scenario). Regarding agricultural pollution, neoliberal approaches will only be successful if land managers can experience substantial private benefits along with the social benefits of enhanced environmental quality. However, more often farmers are facing competing expectations and demands: actions to reduce pollution run counter to demands for high yield agricultural production. While many programs aim to combine public and private benefits, in most cases the integration of these benefits remains elusive (Higgins et al., 2008). Neoliberal approaches, such as environmental management and assurance programs, therefore, may have a limited capacity to address environmental problems in agriculture. This is especially true in cases where farmers are not able to reap meaningful financial benefits for environmental practices. Higgins et al. (2012) argue that how landholders participate or do not participate in neoliberal environmental programs remains understudied or overlooked. In addition, Castree (2008) argues that further case studies are needed to illustrate when and why neoliberal approaches succeed or fail when they move from ideas into practice. Addressing these calls, we conducted a case study of a neoliberal program in the US Midwest that is currently being promoted as a model approach to address agricultural pollution.

In this paper, we examine a relatively new environmental assurance program in the state of Michigan: the Michigan Agriculture Environmental Assurance Program (MAEAP). MAEAP emerged as a result of a collaborative public–private partnership and focuses on verifying farms that demonstrate they have met specific criteria to address farm pollution. Participating farmers can label their products as MAEAP verified and can also display MAEAP signs on their property to signal their participation to neighbors and community members. The program has been identified as a model for other US states to follow; however, many questions remain about farmer participation and the extent of farm management changes. This paper focuses on corn farmers participating in MAEAP and examines reasons for participation, benefits of participation, changes in farm management, and how MAEAP compares to government conservation programs. Findings suggest that MAEAP may increase education and awareness regarding environmental issues; however, it is unlikely to effectively reduce pollution levels associated with row crop production. We find that this neoliberal approach to environmental governance fails to offer substantial market incentives (private benefits) in order to adequately support environmental quality (public benefits).

Agriculture and the environment: the US context

Ninety-nine percent of cropland in the US is privately owned and managed (Lubowski et al., 2006); therefore, the decisions of private land managers have significant impacts on public environmental benefits. Management prioritizing intensive agricultural production and private benefits has resulted in severe pollution in US waterways. A study conducted by the US Environmental Protection Agency (EPA) found that agriculture negatively impacts 18% of assessed rivers and streams and contributes to the pollution of 48% of impaired river miles in the US (EPA, 2002). Water quality impairment results from chemical runoff and soil erosion that harms aquatic organisms and contaminates water intended for human consumption (Richter et al., 1997; Pimentel et al., 2004; Ribaudo and Johansson, 2006; Gomiero et al., 2011).

Use of synthetic fertilizers in the Corn Belt region of the US has contributed to extensive water pollution. Forty three percent of all nitrogen fertilizer in the US is applied for corn production and the low nitrogen use efficiency of corn means that a substantial portion of nitrogen applied is not absorbed and escapes as pollution (Doberman and Cassman, 2002). While fertilizer has increased corn yields, its use continues to contribute to the pollution of rivers, streams, and lakes, and the formation of hypoxic "dead zones" in waterways (Pimentel et al., 1992; Vitousek et al., 1997; Rabalais et al., 2002; Rabotyagov et al., 2014). Largely due to nitrogen and phosphorus in fertilizers, approximately 60% of rivers and bays in the US have been degraded by nutrient pollution (Howarth et al., 2002). Recent attention has focused on extensive algal blooms in Lake Erie linked to agricultural non-point source pollution (Michalak et al., 2013). In 2011, Lake Erie experienced its largest algal bloom in recorded history, thus putting pressure on policy-makers in the region to address nutrient pollution from agriculture. As pollution linked to agriculture receives increasing attention in the Corn Belt, policy discussions have focused on how to best address this persistent environmental problem.

US scientists and policy-makers continue to discuss the best mechanisms to reduce environmental degradation associated with agriculture. Government approaches have focused on conservation programs through the USDA Natural Resource Conservation Service (NRCS), which offer financial incentives to encourage both the setting aside of productive lands and the adoption of conservation practices to protect soil resources, water quality, and wildlife habitat. For example, the Environmental Quality Incentive Program (EQIP) offers financial incentives for farmers, such as cost-share assistance of up to 90%, for the installation of conservation practices. While the adoption of conservation practices may in many cases reduce environmental degradation, resources remain insufficient and policy and market conditions limit farmer participation (Shortle et al., 2012; Stuart and Gillon, 2013). For example, the Conservation Reserve Program (CRP) experienced reduced enrollment and re-enrollment due to higher commodity prices linked to corn ethanol production (Stuart and Gillon, 2013). In addition, funding for government conservation programs will likely decrease in the near future given the current US budget deficit and the political climate in the US Congress.

Facing pressure to reduce government spending for regulatory and incentive programs, recent discussions among policymakers in Washington, DC have focused on becoming more reliant on private–public partnerships and non-government led market-based programs to meet environmental goals. Some politicians have suggested that these programs could replace or allow decreased support for NRCS conservation programs. In general, new voluntary environmental quality and assurance programs are gaining support throughout the US. Existing programs include New York's Agricultural Environmental Management (AEM) Program, the California Dairy Quality Assurance (CDQA) Program, the