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Local comprehensive plan quality and regional ecosystem protection: The case of the Jordan Lake watershed, North Carolina, U.S.A.

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ABSTRACT

To better manage common-pool resources, planners and conservation specialists continue to call for comprehensive and spatial planning functions of local governments to focus on entire ecological units rather than areas defined by jurisdictional boundaries. Local comprehensive plans were quantitatively analyzed and case studies were conducted within an urbanizing lake watershed to determine how well plans support watershed protection. On average, plans are not supportive of lake water resource protection. Plan quality scores revealed a free rider problem, as scores were unexpectedly higher for non-users compared to users of Jordan Lake as a drinking water supply; in other words, local jurisdictions that benefit more from the water supply contributed less in terms of comprehensive planning to protect that supply. Core determinates of watershed protection in comprehensive plans were networks for information exchange, a civic culture supportive of collaborative governance, and a centralized role for planning. To more effectively address regional scale common-pool resources problems, we recommend that (1) state and federal governments require or incentivize coordinated planning among local governments, (2) plan quality principles be applied during creation of comprehensive plans, and (3) plan effectiveness be tracked through time. Integral with these recommendations, future research should identify and test methods and metrics to evaluate plan effectiveness and outcomes.

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Introduction

Improving ecosystems and the services they provide in urban areas is widely acknowledged as a critical societal goal (Millennium Ecosystem Assessment, 2005). As urban growth accelerates across open landscapes, there is increased potential for watershed decline, loss of biodiversity, exposure to natural hazards, and inequities in access to healthy and safe living environments. To deal with these effects, conservation specialists continue to reiterate long-standing calls for management efforts focused on entire ecological units (e.g., watersheds) rather than areas defined by political jurisdictions (BenDor and Doyle, 2010; Brody et al., 2004, 2006; McElfish, 2004; Miller et al., 2008; Stein, 2007).

In this study, we argue that continual resource degradation is a predictable outcome of failure by local government to account for entire ecological units when designing and implementing environmental policy. In part, the failures are due to a common-pool resource problem. Common-pool resources are available to more than one user (individual or locality), difficult to monitor and control access to, and subject to degradation due to a lack of protective activities that sustain the resource (Ostrom, 1990, chapter 1; Sell, 1988). Incentives for local governments to contribute to resource protection are often limited or non-existent, because costs are incurred by individual contributors but the contributions are distributed throughout the ecological system. For example, upstream localities take (and pay for) conservation actions that provide clean water benefits throughout a watershed, while inactive downstream localities free ride as they benefit from upstream contributions but are not motivated to act. The lack of restraint is also due to the tradition of home rule, localism, and reactive decisions driven by short-term gains that dominate land use policymaking in pluralist and market-oriented societies. Local governments are more inclined to make decisions that prioritize private property rights, permit development projects that generate immediate economic gains at the expense of long-term ecological degradation, and divest themselves of civil services, such as planning, that support foresighted future actions.

We examined comprehensive plans because they are a logical first step to establish shared goals and future-oriented

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development strategies for protecting ecological systems occupied by multiple jurisdictions (Berke et al., 2006a, chapters 1–3). In the U.S., the local government comprehensive plan serves as a holistic spatial development policy instrument derived from a process that combines public participation and evidence-based analysis (Kaiser et al., 1995, p. 365). As part of a larger process for guiding and implementing urban development and environmental policies, comprehensive planning activities can foster collaborative approaches among diverse groups of stakeholders that might not otherwise work together on ecological protection. Without such a collaborative approach, prospects for real change in seeking solutions to common-pool resource problems are limited.[1]

While many observers call for collaborative ecological system management to protect critical natural resources (Millennium Ecosystem Assessment, 2005), there is limited empirical research on the role of local government comprehensive plans in the management of large-scale natural systems (see, for example, Brody et al., 2004; Norton, 2008). There is little detail on the range of goals, policies, types of ecological science-based information, and implementation and monitoring actions incorporated into plans or how such plans differ from place to place. Further, U.S. state and federal policy that influences local action on management of transboundary ecological systems (e.g., watersheds, biodiverse habitats) has not accounted for the role of the local comprehensive plan (BenDor and Doyle, 2010) with the exception of natural hazard mitigation (Berke, 1998) and coastal management (Norton, 2005) policy arenas. Lacking federal or state mandates or incentives to develop local comprehensive plans aimed at transboundary ecological systems, little is known about why some localities decide on their own to undertake comprehensive planning focused on ecological systems.

We evaluated the collective potential of local governments to adopt plans that account for protection of a watershed as a transboundary ecological system, building on the only prior study focused on local comprehensive plans within a multi-jurisdictional watershed (Brody et al., 2004). We measured and analyzed the management policies, inter-organizational coordination arrangements, factual basis for selection and prioritization of policies, public participation efforts, and implementation and monitoring programs of local comprehensive plans in the Jordan Lake watershed of North Carolina in the U.S. We sought core drivers that explain how well plans support watershed protection based on quantitative comparisons of plans adopted by local governments that use the lake as a drinking water supply and local governments that do not, and through case-studies of two local jurisdictions.

Conceptual framework: watershed plan quality and collaborative governance

Watershed plan quality

The framework we used to evaluate how well local comprehensive plans support watershed protection was derived from the emerging literature in plan quality analysis, which is thoroughly reviewed by Baer (1997) and Berke and Godschalk (2009). Studies within this literature have focused on a range of topics including natural hazard mitigation (Berke and French, 1994; Dalton and Burby, 1994), housing (Hoch, 2007), climate change (Basset and Shandas, 2010), open space preservation and smart growth (Norton, 2008; Steelman and Hess, 2009), and ecological systems (Brody et al., 2004). Prior plan evaluations are premised on various principles of plan quality with measurable indicators of each principle adapted to the particular domain of planning issues (e.g., hazard mitigation, housing affordability). To date only one study has focused on transboundary watershed protection issues (Brody et al., 2004), and their study used a limited set of plan quality principles. We included these and two additional principles (participation and monitoring) to allow for a more complete assessment.

We derived two sets of principles and associated measurable indicators: direction-setting and action-oriented principles that are consistent with those used in the literature as specified in Berke and Godschalk's (2009) meta-analysis of 16 plan quality studies. Three *direction-setting principles* set the foundation for a clear picture of a desired future: (1) *goals* express desired future conditions that reflect a diversity of public values; (2) a *fact base* provides the empirical foundation for selection and prioritization of policies; and (3) *policies* serve as a general guide to decisions to ensure that goals are achieved. Four *action-oriented principles* establish the use and influence of plans: (4) plan *implementation* actions that assign organizational responsibilities, timelines, and funds to implement a plan; (5) *monitoring* of environmental conditions, and the performance of policies in achieving goals; (6) *inter-governmental coordination* that specifies how a local jurisdiction collaborates with neighboring jurisdictions; and (7) *participation* that identifies the stakeholders involved in plan formulation, and how their input affected the evolution of the plan that reflects the degree of effort to account for public scrutiny of the plan.

Collaborative governance factors that influence watershed plan quality

Effective management of ecological systems depends on collaboration across political, administrative, and ownership boundaries (Brody et al., 2004; Lubell et al., 2002). The literature on collaborative governance indicates that a conceptual framework for examining local government action on regional governance issues (i.e., the degree to which the quality of plans support watershed protection) covers internal and external determinants of action (Ansell and Gash, 2007; Feiock, 2007), and that the influence of each set of determinants varies through time (Francis et al., 2004). Early adopters of planning and policy innovations tend to have internal determinants that make them amenable to take action on their own. These determinants explain collaborative action as a function of the political, social, and economic characteristics of the adopter. External determinants explain collaborative action as a regional phenomenon. From this perspective, interaction of neighboring communities within the transboundary ecological system is a major influence on action. Such interaction is often facilitated by federal, state, or regional programs aimed at stimulating local action. Late adopters learn from their regional context or networks and from local capability building efforts by state or federal programs (Basset and Shandas, 2010).

Research suggests that three sets of internal determinants affect the decision to act: perceived local costs of collaborative efforts relative to local benefits, local relevance of the policy solution, and networks of policy actors and information exchange to support adoption. Whether local governments engage in ecological protection efforts is partially driven by the perceived imbalance in costs and benefits of protection. Communities vary in the value they place on support for collaborative action to protect ecological systems (Ansell and Gash, 2007). Some communities have a history of antagonism toward environmental issues and have established cultural norms that assign high value to economic gain and protection of property rights. In contrast, other communities have a

[1] Studies have consistently shown that the quality of comprehensive plans, once adopted, has a positive effect on local government actions aimed at public health and safety, and sustaining a resource (Berke et al., 2006a,b; Brody et al., 2006; Burby, 2006; Dalton and Burby, 1994). «THis doesn't quite make sense to me. Quality is not defined as good or bad – the quality of the plans doesn't have an effect on anything, the plans have an effect. Either "Studies have consistently shown that comprehensive plans, once adopted, have a positive . . ." OR "Studies have consistently shown that high quality comprehensive plans, once adopted, have a positive . . ."»