

Allee, David J.

Working Paper

Environmental Protection Through Local Land Use Controls

Staff Paper, No. SP 91-05

Provided in Cooperation with:

Charles H. Dyson School of Applied Economics and Management, Cornell University

Suggested Citation: Allee, David J. (1991) : Environmental Protection Through Local Land Use Controls, Staff Paper, No. SP 91-05, Cornell University, Charles H. Dyson School of Applied Economics and Management, Ithaca, NY, <https://doi.org/10.22004/ag.econ.121377>

This Version is available at:

<https://hdl.handle.net/10419/276837>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

CORNELL
AGRICULTURAL ECONOMICS
STAFF PAPER

ENVIRONMENTAL PROTECTION THROUGH
LOCAL LAND USE CONTROLS

David J. Allee

March 1991

A.E. Staff 91-5

Department of Agricultural Economics
Cornell University Agricultural Experiment Station
New York State College of Agriculture and Life Sciences
A Statutory College of the State University
Cornell University, Ithaca, New York, 14853

It is the policy of Cornell University actively to support equality of educational and employment opportunity. No person shall be denied admission to any educational program or activity or be denied employment on the basis of any legally prohibited discrimination involving, but not limited to, such factors as race, color, creed, religion, national or ethnic origin, sex, age or handicap. The University is committed to the maintenance of affirmative action programs which will assure the continuation of such equality of opportunity.

ENVIRONMENTAL PROTECTION THROUGH
LOCAL LAND USE CONTROLS

David J. Allee¹

ABSTRACT: Local land use controls seek to limit the impact of one neighbor on another - sometimes protecting natural resource environmental values. Federal and State programs to protect environmental values cannot do everything. They leave a residual risk of environmental loss that local people may want to address. Land use controls are traditionally zoning, subdivision control, and site plan review. These and other local controls have advantages in reducing risk, particularly when they are a part of an integrated approach that makes full use of the advantages at each level of government. Aspects of partnership approaches are discussed.

In 1989, 449 members of the New York Planning Federation were asked to indicate if they used land use controls to reduce environmental risks, particularly risks to water quality. Freshwater wet lands, flood plains, and watershed rules and regulations are used in addition to traditional land use controls. Modifications to land use controls were made by almost half of the jurisdictions to protect natural resource environmental values, 26% to protect water quality. A fifth recognized they have water quality problems but as yet had not adapted their land use controls to this need. One third of the responses indicated they were involved in inter-governmental cooperation in the management of their controls - half the time with the county. The State should debate how and whether it chooses to stimulate changes which would encourage the use of the untapped potential for local land use controls to protect environmental quality.

¹ Professor of Resource Economics, NYS College of Agriculture and Life Sciences, 214 Warren Hall, Cornell University, Ithaca, NY 14853.

INTRODUCTION

Local land use controls are usually thought of as consisting of zoning, sub-division controls, and site plan review. Risking over simplification, it can be said they reflect community preferences, respectively, on where activities should be located, the terms under which land may be divided for those activities, and the arrangement of activities on the parcel of land.

In the broadest sense, land use controls are environmental controls in that they seek to restrict the harm that one land user can cause to another. Causing benefits for your neighbor may be an intent of controls but traditionally that is not a basis for invoking the police power of government. Protecting land values, concern for the efficiency and esthetics of urban growth are reasons for their adoption. They are a way to implement a master plan for a community. The zoning map, with the record of changes adopted to it and without any other planning document, can be the extent of the plan and planning that supports the actions of the planning board, board of zoning appeals and the other village, town or city officials who implement this elective local government function.

Modification of these land use controls for the protection of habitat values, air and water pollution and other modern concerns of environmental management is not usual, but is probably growing. This paper reports on a 1989 survey of 449 municipalities who were members of the New York Planning Federation (NYPF). The survey sought to determine the extent to which local officials think of their land use controls as tools for environmental protection in this natural resource management sense. Particular attention was given to groundwater as an illustration of a recent focus for national concern.

Certainly there are a growing number of environmental issues where land use controls are a feasible local policy alternative. In other words, these controls have consequences in terms of effectiveness and burden that local constituents may be prepared to support. Examples pertinent to water resources include protecting groundwater recharge that feeds public wells, protecting wetlands, management of stream corridors including flood plain management, limiting tree cutting, discouraging aquatic weed growth through nutrient runoff control including nutrients carried by silt.

Note that for most environmental issues there are State and Federal programs aimed at managing these problems by other means. So why should local land use controls be used as well?

State and Federal programs can only do so much and not always enough. In every case of environmental management through State and Federal programs there is a residual risk of the problem asserting itself at a level that local voters may find unacceptable. In many cases the tools available to State and Federal programs can't be fine tuned enough, in others they just

don't work very well. The policy tools available to local officials to deal with the complexities of the risks can be more effective and efficient. This should be particularly the case where local knowledge and person-to-person contact are important.

Partnership approaches that use the various advantages of each level of government should be most effective. There are essentially four categories of policy tools to consider integrating; regulation, information, cost-sharing, and reorganization. Regulation as a policy tool should be more effective if it is used to approach the problem on several levels at once. Local, state, and federal regulators have different advantages in reaching the production, distribution, use and disposal of a toxic chemical, for example.

Other policy tools need to be used in ways that are complementary to a coordinated, multiple level approach to regulation. Information programs, and research to support them, help all participants and stakeholders be more effective whatever other solutions are tried. Changes in understanding usually drive new responses to a problem. Cost-sharing and other fiscal measures change the burdens and incentives for action in a different way than regulation. Reorganization, such as restructuring agencies, creating new programs and establishing new public and private entities, is an additional possibility for ways to respond to a problem in addition to regulation. Watershed organizations that provide a way to federate local governments and serve as a vehicle for State and/or Federal cooperation are a particularly pertinent example.

All approaches are usually needed in one way or another. They all can and do operate at each level of government. Society should be more effective in solving problems like the risk of groundwater contamination if these tools and levels of government complement each other.

Achieving such cooperation should be facilitated if we know more about the differences between local governments and what to expect. Given the large number of local governments, surveys such as that reported here are an efficient way to increase this kind of understanding.

The Sample and Survey

In the early part of 1989 questionnaires were mailed to 449 members of the New York Planning Federation (NYPF) representing different municipalities. This mailing list was provided by Sheila Clifford-Bova, the Executive Director of NYPF. With several reminders, 277 questionnaires were returned for a creditable 62 percent response rate.

This solid rate of return probably reflects not only a concern for the subject, but also the ease of completing a short, well crafted questionnaire. Questionnaire design was carried out by David Kay, Research Support Specialist in the Cornell Local Government Program. We benefitted from earlier drafts prepared by a committee of NYPF with particular assistance from Professor Paul Marr, Chair of the Department of Planning, SUNY - Albany. Amy Waterman, Graduate Assistant in the Cornell Department of Natural Resources assisted in the analysis of the data.

As might be expected from members of the NYPF, zoning and subdivision controls were common - 92% have these tools compared to the roughly 65% of towns, villages, and cities reported in a compilation by the NYS Department of State. Site plan review was a tool available to 88% and 41% listed architectural review. Results from this survey overstate the level of local planning statewide, but the responses do illustrate the range of tools currently and successfully in use.

An earlier survey reported by Nelson Bills and Tom Cosgrove shows that nearly 80% of the 942 towns in New York have planning boards. Zoning and subdivision regulations are on the books in 59% and 54% of the towns, respectively. Villages and cities that make up the rest of the 1500 local governments in the state are more densely populated and are more likely to have these traditional land use controls and are more likely to have other controls as well.

Specialized Controls for Water Resources

Respondents were asked if they had water resource related controls other than zoning, subdivision controls, and site plan review.

Two-thirds said that they regulated flood plains with additional special rules. Many communities were undoubtedly moved to consider flood plain regulations in order to qualify their citizens for the highly subsidized federal flood insurance program, an interesting case of intergovernmental incentives for natural resource management. Not all communities have areas that meet the 100 year flood risk requirement. Those that have these areas charted on federally provided maps that did not adopt such rules can be expected to have them imposed by New York State Department of Environmental Conservation under complementary New York legislation. The basic regulations are to have no first floors and utility controls below the predicted 100 year flood elevation. To qualify residents for the flood insurance, the rules are to restrict constrictions of the floodway, that is the streamside area needed to pass the flood, to changes that taken together would increase the 100 year flood level no more than a foot.

Freshwater wetlands were separately regulated by 39% of the NYPF members who replied. State programs for wetlands regulation are limited in several ways. The size of wetland regulated, except under special designations, is over 10 acres. There is also a fairly cumbersome classification system involved. Given the open space, wildlife, flood control, and water quality benefits provided by wetlands of smaller size and of types not unique on a statewide basis, it should not be surprising that so many communities have chosen to regulate them. National recognition has been given to the rapid loss of wetlands in the evolution of the regulatory program carried out by the U.S. Army Corps of Engineers and reenforced by the U.S. Environmental Protection Agency (USEPA), the so called "404 Program." The U.S. Fish and Wildlife Service, U.S. Soil Conservation Service and other agencies have complementary programs. Along with the Corps they have expanded efforts to build wetlands habitat, for example.

Thirty-five percent of the respondents said that they had part or all of their jurisdiction covered by Watershed Rules and Regulations (WSR&R). WSR&R are a locally initiated but partly State enforced system intended to protect drinking water supplies, either ground or surface. With technical assistance provided by the NYS Department of Health, a water purveyor, usually a local government, proposes a set of rules and agrees to provide annual inspections of those so covered and is expected to make annual reports of those inspections. If on inspection and receipt of a notice a violator does not comply, the Commissioner of the Department of Health can enter the picture. Clearly the inspection process is important to effectiveness and potentially is financed as a part of the cost of management of a water system. The prospect of state enforcement, however rarely it may be utilized, should give the local inspection process more rigor.

WSR&R are often used to regulate in one jurisdiction to protect water distributed in another jurisdiction. This power is quite different from traditional land use controls. An alternative is the approach used by the Adirondack Park Agency - an overlay of state controls with limited local role in their use.

WSR&R are not to restrict the use of land so much as to limit practices and locations of particular activities. Septic systems or certain chemicals may be excluded or limited within a specified distance of a public well or a stream bank. This program predates the use of chlorine to disinfect for the removal of pathogens and is being revived to deal with turbidity and chlorine resistant pathogens in reservoirs such as giardia. WSR&R are also seen as useful in risk reduction from the expanded use of toxic chemicals that are resistant to water treatment. A major incentive is to avoid the very costly slow sand filtration systems now required by USEPA nationally unless equivalent protection can be provided. In addition to New York City and Syracuse, over 200 communities under 10,000 population face this problem.

Under the multiple barrier philosophy of public health practice such controls can be advocated almost independently of how effective other elements in the water protection system may be. The point being that no one barrier can be expected to be perfect, to be free from human failure, and that human health should be too important to take the chance involved.

Four percent indicated other controls that neither fit under the traditional land use controls nor were one of the above.

Response to Environmental Problems

Were modifications made to land use controls in response to specific environmental problems? Almost half of all respondents, 45%, reported that they had responded to specific environmental problems, and a quarter, 26%, listed water related problems. Of these who had responded to specific environmental problems, 35% of all respondents indicated they had used their zoning and subdivision regulations in that response.

When asked specifically about contamination, actual or potential, to either ground or surface water as a motivator for the adoption or modification of controls the response was as follows:

Controls Adopted Because of Concerns About:

	Ground Water	Surface Water
	<u>(percent of all respondents)</u>	
No - No water quality problems	58	60
No - But have water quality problems	22	20
Yes - Adopted controls to meet problems	20	20

Surprisingly none indicated that they had controls without also having water quality problems. It could be expected that such controls would be seen as a way to prevent problems.

Lot size restrictions were indicated as the most frequent response to the risk of groundwater contamination. The questionnaire did not explore the use of permit procedures to reduce risk of contamination by either limiting the types of chemicals used or the measures taken to handle them safely.

Note several implications of these data. Is the perception of the extent of problems accurate? It can be argued that a higher proportion of municipalities have water quality problems than indicated here - at least have the potential for such problems at a level of risk where some local action is justified. Is this perception of a problem just a question of more information about the risks? Or is it also a question of perception of responsibility? In other words, are those community leaders likely

to answer such a questionnaire apt to be well informed about water quality if they do not feel responsible for preventing it? This may also help explain why half of those who are aware of problems have not acted to adapt their land use controls to prevent them.

Intergovernmental Cooperation in Land Use Controls

One third of the respondents indicated that they utilized formal or informal relationships with other governments to assist them in the administration of their land use controls. Being accustomed to intergovernmental cooperation is significant because watershed lines typically cross political lines.

The most common cooperative relationship reported was with the county, accounting for 16% of the total responses. Half that many, 8%, related to other towns, villages, and cities. Only 5% related to regional entities such as regional planning and development boards. And with as many, 5%, we couldn't tell from the response with whom they worked.

The character and adequacy of this cooperation was not explored, nor was the relationship, if any, to state agencies.

Recall that the 34% that reported cooperation in land use controls is about the same proportion as reported being aware that they had Watershed Rules and Regulations under the NYS Department of Health program. It is not clear that from the way the question was phrased that respondents would have thought of state relationships to report. In any case, there is no program for state reinforcement of local land use controls that is comparable to the DoH relationship to the design and enforcement of WSR&R. Some training is available from the NYS Department of State, a modest amount of technical assistance from the NYS Department of Environmental Conservation and the Soil and Water Conservation Districts, and some grants in the Adirondack Park Agency region. Another source of State assistance is the funding through NYSDEC to the some 20 counties in the Finger Lakes Water Resources Board affiliated with the Finger Lakes Association. For some years the NYS Legislature has provided funding for this program that emphasizes reducing nutrient runoff through land use analysis, controls and other incentives and direct harvesting in aquatic weed control.

Further Discussion

It is likely that the perception of potential or actual local water quality problems will increase. The more of a jurisdiction that is contributing to contaminated runoff the more likely it should be to take action. It would be instructive to array the proportions of communities that include in their borders land that contributes

runoff or underground flow to a stream or shore segment identified as under some level of stress in the NYSDEC classification system. Those classifications are updated every few years and have been used in community information meetings. They are also featured in a new program of the Soil and Water Conservation Districts to facilitate the development of county level water quality strategies through a multi-agency planning process. Cornell Cooperative Extension is cooperating in many counties to provide an educational dimension to the effort.

A similar stress classification system and reporting process for groundwater is under development. It, too, should add to an increasingly accurate perception of where problems exist.

Another recent program that is sensitizing local officials to the alternatives for their role in water quality protection is a series of wellhead protection studies being carried out by Regional Planning and Development Boards with federal funds allocated by the NYS Department of Environmental Conservation. These studies identify the hazards in the well recharge zones and the measures that can reduce the risks from those hazards.

These programs follow on the heels of past efforts to energize local awareness and responses that include:

- reducing the risk of leaking underground storage tanks,
- building awareness for best management practices to reduce non-point pollution from various sources including agriculture, forestry and construction,
- a number of watershed projects that included planning and cost sharing,
- aquatic weed control and other lake management,
- stream corridor management information.

Final Thoughts

Community leaders will become more aware of the conditions that lead to contamination and this may lead to more support for a prevention approach that does not depend upon the crisis atmosphere that is produced by discovery of contamination. Other research suggests that where such a crisis is the basis for a public response there is a tendency to restrict that response to just the cause involved in the crisis at hand. If comprehensive planning for water quality protection has been carried out, there is a better chance that the response will consider other equally valid risk reduction measures.

Balancing the burden of risk reduction with its benefits is difficult because different people bear those burdens and enjoy those benefits differently. Experts can provide more information on the hazards and how they are distributed over the landscape, how they relate to different water supplies, how effective particular technical measures may be. But weighing the values involved in the distribution of burdens and benefits is a part of the policy issue that is faced primarily by leaders and elected officials.

Controls available to local officials have advantages of many kinds in the management of environmental and natural resource problems. Some of those advantages are indicated above. Exploring the possibilities for a partnership approach between levels of government and the several agencies at each level should be and is a part of the policy process. This report has indicated some aspects of that partnership, but has probably raised as many questions as it has answered. In any case the potential for more intensive use of local land use controls to achieve water quality objectives is substantial. The state should debate how and whether it chooses to stimulate the changes which that potential suggests.

*** Extension of remarks made at the Annual Meeting of the Empire State Chapter of the Soil and Water Conservation Society "Land Use Dynamics in Rural New York" 14-15, November 1990, Albany, New York. ***

This text benefitted from the discussion at the above meeting and from comments from Susan Turnquist, Amy Waterman and David Kay who are engaged in related research or extension teaching in cooperation with the Cornell Local Government Program and the New York State Water Resources Institute at Cornell University.

The research reported here benefitted from partial funding from the New York Water Resources Institute at Cornell University, and from funds provided by the Kellogg Foundation to the National Groundwater Policy Education Project.

Other Agricultural Economics Staff Papers

No. 90-15	A Conceptual Framework for the Management of Farm Businesses	R. A. Milligan G. K. Hutt
No. 90-16	Modeling the U.S. Dairy Sector With Government Intervention	Donald J. Liu Harry M. Kaiser Timothy D. Mount Olan D. Forker
No. 90-17	Policy Education Programs for Extension's Solid Waste Initiative	David Allee
No. 90-18	Social Security Tax and Benefit Issues, Questions and Answers for Farmers and Workers	Stuart F. Smith
No. 90-19	Debt-For-Nature Swaps and the Environment in Africa	Steven C. Kyle
No. 90-20	Advertising and Promotion Investment: What is the Right Level?	Olan Forker
No. 90-21	Use of Firm Level Agricultural Data Collected and Managed at the State Level for Studying Farm Size Issues	George L. Casler
No. 90-22	Recent Trends in Food Availability and Nutritional Well-Being	Thomas T. Poleman
No. 91-1	Biological Emissions and North-South Politics	Thomas Drennen Duane Chapman
No. 91-2	Equitable Patent Legislation for Developing Countries	William Leazer
No. 91-3	How Not to Farm Together	Eddy L. LaDue
No. 91-4	Honey Industry Survey: An Update	Lois Schertz Willett