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SUPPORT FOR LOCAL GOVERNMENTS IN GROUNDWATER PROTECTION

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Abstract

Local government capacity -- its ability to do what it wants to do -- is often inadequate to protect groundwater from contamination. Yet many of the steps in the conventional prescription for groundwater protection call for activities that are virtually the exclusive province of local governments. Not the least of these is land use control--yet the boundary problem alone limits the ability of local governments to act adequately. As in many other problems, federations of local governments need to be supported by federal/state partnership programs. In this problem low capacity rural governments are a major potential. Several agencies with state and local networks stand poised to, or are already in the game. There are some good reasons to have a variety of agencies involved as is the case in most complex public issues. Local governments are accustomed to coordinating state and federal agencies. But improved results can be expected if one or more of these responding programs explicitly tailor their efforts to build local management capacity. A variety of tools are available and should be explored by educational and federal assistance agencies such as Cooperative Extension and the Soil Conservation Service for research programs such as the U.S. Geological Survey, and action programs such as the U.S. Environmental Protection Agency.

Introduction

To date, a relatively small number of local governments have taken vigorous regulatory steps to protect groundwater. Some large local governments heavily dependent upon groundwater have been quite sophisticated about it. Dade County, Florida and Suffolk County, New

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[1] Two other versions of this presentation have produced very helpful responses. The first was at the third National Symposium on Groundwater Pollution Control sponsored by the U.S. Environmental Protection Agency and carried out by a university consortium led by the University of Oklahoma. The focus of the symposium was on local government options. Many of the points included here were suggested by various speakers prior to my wrap up slot.

Likewise the members of a seminar on groundwater problems sponsored by several Cornell departments and the CU Center for Environmental Research provided many helpful comments.

Finally, the Cooperative Extension agent training workshop held at the Chautauqua Institution in May 1986, sponsored by the Northeast and North Central Rural Development Centers, allowed some practitioners in capacity building to react.

York are examples. Even there, much less governments with fewer resources or incentives, have encountered a host of limitations in achieving what they wanted to do. Note that some have argued that this is the best working definition of local government capacity -- its ability to do what it wants to do.[2] But in the inter-governmental context, capacity also means the ability to do what it wants to and satisfy what state and federal policy wants to accomplish through local government action. Local governments after all, are constitutionally creatures of the state, and politically are held responsible for most of the same things for which we hold those other levels of government responsible. With a concurrent expectation of independence, we have a challenge for most Federal agencies to carry out significant mandates. Incentives have to be provided to cooperate. Results come from a partnership approach.

First, what are some of the elements of groundwater protection and why do they call for local government participation? Second, what are some of the characteristics of local governments and how do they fit the task? Third, what are some ways in which local government capacity can be augmented by a federal-state program? Choosing among these constitute some of the public issues in local government options for groundwater protection.

Elements of Risk Management in Groundwater Protection

There are a great many hazards to groundwater. The probability of contamination is a function of a more complex set of interactive physical and behavioral attributes than in surface water or air pollution. There is considerable agreement as to how to go about reducing that risk. This conventional wisdom has some major problems in the feasibility of its implementation that may be only dimly apparent at this time, but that should be clarified with more experimentation and evaluation.

First, we are admonished to identify this resource that is out-of-sight and out-of-mind. Location, extent and vulnerability call for scarce skills and reveal a resource that is very idiosyncratic, very site specific. To be managed, it must be understood locally.

Second, monitor both quantity and quality, as it is clear that these attributes interact. Modeling pollutant fate is a challenge. Lab work can be very expensive and imperfect. Rarely appreciated, judgment is important. First, because once water is found contaminated it may be lost for years. Second, testing for all possible contaminants is impractical. Third, once found, only a few standards exist. Many times the standard, if available, is for drinking water at the faucet, not as

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[2]John J. Gorgan, "Consideration of Local Government Capacity," Public Administration Review 41 (November/December, 1981) 649-658 and Timothy D. Mead, "Issues in Defining Local Management Capacity," in Beth Walter Honadle and Arthur M. Howitt, Perspectives on Management Capacity Building, State University of New York Press, 1986, Albany, NY.

a warning for action when it is in the ground. Under present programs it will be decades before coverage of all potential hazards by standards or even gross toxicological characterizations is complete. Monitoring is itself risky for those who take it on.

Expectations are for a more precise process than is attainable. The old pre-chlorine tradition of the sanitary survey, where monitoring is also a catalogue of hazards and their amelioration, is only sometimes recognized in the current prescription, yet is probably particularly relevant to prevention and the potential role of local governments. Monitoring the health and functioning of institutions able to reduce risk is even less usual.

The third part of the conventional prescription is to manage quantity. Withdrawals and recharge are regularly related to quality changes. For example, to close one well is to invite increased use of those that remain, drawing the pollution towards them.

Fourth, manage potential individual sources of contamination directly. Sources of hazards that are detected in the monitoring may call for remedial action which is usually quite expensive. Technical risk reduction requirements for particular hazards can be differentially applied depending upon the degree of vulnerability and the magnitude of the consequences. Some requirements can be so expensive as to preclude a particular land use and amount to land use controls.

State and federal programs pointed at source control, such as waste generation, typically must be selective in the level of hazards to be controlled. Minimum sizes for control can be set higher in statute and particularly in practice, than may be desirable from a local point of view. Some sources of local significance may not be controlled at all by state and federal programs.

Finally, but not uniformly, the question of land use controls responsive to the groundwater protection needs is raised. Not every part of the landscape is equally vulnerable nor equally important as a recharge area. Risk varies by land use and vegetative cover, soils and geology. Existing well fields attract immediate concern, but what about the well field of the future, needed for growth or insurance?

Non-degradation, as a policy, is a place to start and many will and can seek to achieve it, but not all. "How safe?" is a question that must be answered more often than not. It is fundamentally a political question, but is so demanding in terms of understanding what is involved that we look to experts to simplify the decision process. Local decision makers can be expected to turn to any available authority figures. When they disagree, which is not uncommon, the political process will need supplementation and support.

Some Strengths and Weaknesses of Local Government

How motivated are local governments to fill the gaps left by state and federal programs? What advantages do they have in complementing those programs? Certainly like many others, local leaders are also low on the learning curve for the topic of groundwater protection, but as a group probably no less aware and concerned than others. They have much relevant knowledge and existing capacity, such as in water supply provision and land use controls. They are better enlisted as part of the solution rather than left to be part of the problem. Their stake is high. Discovering what people want is one thing local units can do well, and probably accounts for their continued increase in numbers in the face of much conventional wisdom that they shouldn't. Indeed, it is fashionable to urge consolidation of local governments as a general concept, if not as a specific policy.

When they discover they want to protect their groundwater, many local leaders will find their capacity limited. They will know a great deal about their economy and their physical setting, but for most, there will be major information gaps. What hazards do various industries pose? How vulnerable are various parts of the landscape?

Boundaries and size are a problem. The natural system often won't fit exactly and some kind of federation of local units will be required. Individual units will have an incentive to protect themselves but that may not be enough to protect their neighbor's stake in what they do. Individual governments will often balk at the cost of getting data to characterize the whole system. Once it is understood that laxity in chemical housekeeping on the part of one neighbor may cause another harm, more support for joint actions or outside help should materialize. For example, dealing with principle employers on land use issues, especially if they are large national concerns, may be much easier if there is a federation of local governments supported by the state.

On the other hand, local officials are quite accustomed to dealing with the common lack of coordination among and between state and federal agencies. In the normal course of events, resource agencies may be partly out of step with health agencies, that in turn may not be in tune with economic development agencies. Superior understanding of the local situation and needs can help greatly in achieving coordination, but the manpower and expertise has to be there to work with the state and federal agencies.

With the stakes identified, cooperation matching the system boundaries, capability to bargain with larger organizations, and the system effects of particular hazards adequately understood, local governments can put to use some other potentials. Some face-to-face relations come easier between neighbors, and that level is more effective at building social pressure to achieve acceptable behavior from a large portion of the population. Who but local officials would be effective in encouraging reduced lawn fertilizer and have pesticide use, or in reducing the toxic loading in the solid waste stream? Finally, local dominance in, and jealous guarding of land use controls

suggests that a national strategy must be achieved in significant measure by making local governments the agents of that national policy.

What to do? Low capacity in local governments will be found combined with generally inadequate understanding of the hazards and of the system to be protected. Just enough incentives must be added to federate, to investigate, and to manage the shared part of the problem. That is, the help need only be enough to make up for the incentives provided by the stakes already recognized by the local people themselves.

But, if as many believe, only a small part of our groundwater is contaminated, and most of the hazards in the past have been in urban areas, then most of the clean groundwater is in rural areas, much of it in the jurisdictions of low capacity local governments. Luckily, in the long run, risk management may be less demanding as well. Major hazards may be from urban sprawl into rural areas, and flight of high risk activities from regulation in urban areas. I would expect overall a predominance of land uses that balance a stake in protecting the land with a capacity to contaminate it. Farm and forest landowners should not take long to recognize that the first well they will contaminate is their own. Protecting groundwater significantly may be a question of rural governance capacity.

Change Agents and the Advantages of a Multiple Entry Approach

The United States Environmental Protection Agency has a lead role for groundwater protection among federal agencies, but it is certainly not alone in either current responsibility or potential role. The U.S. Geological Survey, with its several hundred offices and linkages to the university community, is a case in point. The EPA and its Office for Groundwater Protection are linked to each state, providing some funding and considerable inspiration for the development of state programs. Thus, working through health and natural resource agencies in the states, support can be provided for local governments. Typically, health and resource agencies have frequent and extensive contact at the local level. Permits, inspections, cost-sharing, and some technical assistance provide many relationships upon which local groundwater management capacity can be built.

One of the few attempts to stimulate water quality planning, that under section 208 of the PL92-500, is instructive. As Jaffe observes (1986), some of the less than fifty cases of local governments going beyond current federal and state program requirements to specifically protect groundwater were stimulated by "208" planning projects. If the approach is to protect some critical areas from multiple hazards, it was probably a "208" result. Restricting a particular hazard everywhere in the jurisdiction, however, was more likely to be stimulated by an incident involving that type of hazard. If "208" had had the luxury to pace its support to the rate at which change can be expected to take place in a multiple jurisdiction setting, it would have more results to show. Likewise, the compulsion for problem comprehensiveness and technical completeness probably meant that much was done for which there

was no audience. A more targeted "Son of 208" program might be expected to be more cost-effective.

Note that in the "208" projects, regional, multiple jurisdiction, non-point source control was the main concern. Point polluters already had multi-year permits and most municipal plants were in the waiting line for funds. Farm, forest, and urban non-point sources were explored in cooperation with technical staffs that already related to those classes of land uses, the U.S. Soil Conservation Service, and its network of cooperating state and local agencies, the Forest Service, and urban planning agencies. Complementary action accelerated results and left behind a wider and deeper commitment than if that cooperation had not been sought.

Note further that in some cases the regional "208" effort did not attain credibility, nor a consensus that anything should be done. While a regional management entity was to be proposed, few if any new ones came about, although some existing regional planning agencies were strengthened. It is the nature of proposals for action that once discredited, a particular change agent needs time to re-establish itself. Another change agent may have more success with a proposal, particularly if it can positively build upon the awareness created by the earlier attempt. Thus, in a number of ways, multiple entry into the regional system will be more effective than a single agency approach. To be most effective such entry must have strong community level linkages.

Who has a network of resident change agents that might be encouraged to help in building capacity for local groundwater protection? The public health system is joined in most states by natural resource agencies, such as fish habitat managers, to achieve water quality protection. In addition, forest and wildlife management programs offer complementary possibilities. In western states, this includes the management of public lands; although federal facilities such as military bases can be significant in the east as well as the west. Regional and urban planners have been supported in the past mostly through housing and urban development programs, but just as in the "208" program case, other programs have taken advantage of their strategic placement. Coastal zone management is another case in point.

But if this is a largely rural need, as seems likely, special attention must be given to the USDA programs. The Soil Conservation Service has had an agreement to provide technical assistance in soil and water sciences with almost every one of the some 3,000 counties in the country since the 1930s. In many cases, their technician, attached to a county soil and water conservation district, probably has a unique potential to understand and interpret groundwater phenomena. Since the 1950s, thousands of small watershed projects for the conservation and development of surface water have been organized with SCS assistance. In more recent years, organization at a larger multi-county regional level has been added. These resource management projects are still sub-state, however. Flood control has been a major focus of watershed projects in addition to erosion control. The parallels between flood plain management through land use changes and aquifer protection need to

be explored, they should be quite complementary in the future. A great strength should be the tradition in SCS of identifying a very long range objective, e.g. erosion control, and seeking support in the community for its achievement.

Another local agency cooperative with the USDA is the Extension Service/Experiment Station network. Potential for a contribution to groundwater protection is high, particularly where it is linked to the U.S. Geological Survey-supported State Water Institute program and/or the Sea Grant Program. The tradition here is to work with locally perceived concerns. State as well as local independence from central direction can be high. But both the Extension Service and the Experiment Station sides of the house have identified groundwater protection as a high priority for new initiatives and have asked for Congressional financial support to allow it, even ahead of more traditional concerns (ECOP, 1986; ESCOP, 1986). A feature of both policy statements is recognition of the need for both programs to be evenhanded between all the sources of hazards in the management of risk of contamination, and not to concentrate only on the agricultural sector, the traditional client group. Again, staffing has for many years been extensive at the county level.

The Agricultural Stabilization and Conservation Service, the Farmer's Home Administration, and the Forest Service complete the picture at the USDA. ASCS has provided payments for conservation practices for many years. FmHA has financed community capital investment -- with sewer and water grants being the most significant -- and utilizing innovative approaches to ability to pay. In addition to concern for the non-point pollution aspects of forest management, the Forest Service is a major direct manager of federal land. While ASCS and FmHA continue the pattern of local, usually county-level offices, FS operates more through state forestry agencies.

Other federal agencies deal with resource management and various aspects of water that are complementary to groundwater protection. Many are increasingly involved with groundwater; others could and should be. The U.S. Geological Survey has been mentioned several times here and is the principle source of characterizations of local groundwater conditions. It has embarked on a monumental survey of water quality conditions. The importance of its programming in support of local management capacity cannot be over emphasized. Such capacity may be able to expand only a little faster than the ability to interpret the resource. The expertise pool needed to expand this base is heavily concentrated in USGS.

Other U.S. Department of Interior agencies must be recognized. The recently newsworthy problems with selenium in return flows from irrigation on the western side of the southern central valley of California, highlight the fact that Fish and Wildlife Service concerns with irrigation impact on habitat resources go back many years. Their concern is only partly with its sister agency in Interior, the Bureau of Reclamation. Bureau of Reclamation water directly accounts for less than a fifth of the irrigation in the West. But its main program combined with its small project loan programs, it has the potential to

reach the 25 to 35 percent of the land that faces the need to dispose of contaminated waste flows illustrated by the Kesterson selenium case.

Others should be mentioned. But surely the point has been made that many federal programs are in a position to assist in the development of local capacity to manage and protect groundwater. The problem is for each of these to work out successful patterns to adapt their programs to this ubiquitous opportunity.

Note that these programs are technology and science driven. While management and policy sciences play a role, and could play a larger one, research results from the "hard" sciences have a catalytic effect and provide legitimacy for policy changes within most of these agencies. A program of research to support groundwater program development in each of these agencies is thus a policy issue intrinsically and organizationally.

Under existing policy, U.S. EPA supports research that is directly focused upon the operating problems of its several programs. At present the separate research and development programs at EPA are restricted to hard sciences in the belief that they need to be isolated to maintain creditability. If it becomes accepted that local governments are agents of EPA in the exercise of a national policy for groundwater protection, the portfolio of research investments would change substantially. For example, one line of inquiry that might be added is to discover the principles and data needed to design risk management steps where information needed is faulty in significant ways. Likewise, the more effective steps in local government capacity building needs more investigation. But under present arrangements, their kind of work would have to come from an operating division.

Approaches to Capacity Building

Students of capacity building have identified a variety of generic strategies for inducing capacity building.[3] Information, technical assistance and targeted funding are usual approaches and have been the focus of prior symposia in this series. Some of the more important aspects of these generic strategies should be mentioned here, as well as some variations that are particularly related to groundwater protection. Long term state funding of local programs and federal funding of state programs may be equitable and efficient ways to build the wider interest into what could be too narrowly drawn decisions. But short term, targeted funding, can ease an agency over the risk of a new venture, and hopefully leave behind more willingness to support new functions when the funding is withdrawn. This has been successfully done with seeding new skills, developing new offices, and introducing decision making procedures and new technology, such as computers. Evaluation assistance when there is a recognized need to improve performance can lead to long run changes.

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[3]An example drawn upon here is Bruce Jacobs and David Leo Weimer, "Inducing Capacity Building: The Role of the External Change Agent," Honadle and Howitt, op. cit.

But even before money can be used well, information and help in moving up the learning curve can speed the process of change. Information does not necessarily move to where it is needed without time and effort -- particularly if the recipient doesn't know that he needs it. Problem awareness can be induced by monitoring the case studies of successful responses to problems and then information about preventative measures may find a willing audience. Once the need is established, networking between those with common problems can be facilitated. If it is left to chance, Networking again, will not work as well as if it were supported.

Personnel development is an important aspect of capacity building. Personnel standards, developing a sense of professionalism, direct training, personnel exchanges, and joint projects facilitate the ability to achieve what an organization wants to do.

Several specific areas of activity suggest themselves in the role of local governments in groundwater protection. First the political constituencies of the jurisdictions involved need to become more sophisticated on the elements of risk management. Second is the related problem of supporting more management rather than relying upon technology. Finally, is the need for regional organizations that strengthen rather than replace local capacity.

Citizen awareness can be stimulated by many avenues and at relatively low cost. Luckily, the largest part of the public is already conditioned, perhaps overly so, by the media. Agencies cannot compete with the media, but the media can and should be lobbied. Reporters, and those they can depend on for information, need to have a better understanding of such topics as the basis for standards or risk management. More to the point in capacity building is to encourage a few more people to join the ranks of those that participate directly in local affairs. There aren't many to cover all the issues.

Water well testing for private residences would seem to be a fruitful place to start. Facilitating the collection, analysis, and interpretation of samples should leave a scattering of better informed people through suburban and rural areas. Distribution of information, follow up with meetings, and providing opportunities for more advanced experiences through tours and workshops, can glean citizens who are more ready to be effective in local affairs. Such a program extends the concept of monitoring to combine the technology of lab analysis with aware citizens into an early warning system that has more built-in capacity to use the warning.

Inherent in the role left for local governments is the need to put more emphasis on management instead of depending upon technology and capital investment. "Superfund" clean up of toxic waste sites, which now includes some cases of pesticide applications, represents the expenditures of large amounts of money. Could better management have prevented them? Of course, we expect it to do so. The same applies to the dispersed sources. The small lots of toxics, the old paint, motor oil, solvents, pesticides and cleaners may eventually be diverted from

the solid waste stream. Not all household septic systems can be put into central sewers. Septic tank inspections, even public ownership of septic tanks and leach fields, represent the sort of shifts that seem needed.

Regional organizations that match the boundaries of the physical system to be managed seem to be another necessary step. The point is that no two aquifer systems are in the same situation in terms of what is needed and will be supported. Flexibility is necessary, yet there is the need to recruit and adapt local powers and functions to the needs of groundwater protection. The public health function, particularly in the area of drinking water protection, is an important point of departure in most rural areas. In areas serviced by central water systems there is the fear of effective abandonment of any aquifers not clearly identified with such water supplies. Reinforcing the local regulatory programs may mean increasing local understanding of present and future water supply needs. Existing councils of governments, regional planning boards and the like, are an obvious place to start.

But at some point, joint activity must go beyond information. For example, how to locate high risk activities, or pay for a new solid waste or toxic disposal facility. Many prototypes are available. Florida's regional water management districts or Ohio's conservancy districts are examples of regional activities that have unusual capabilities to facilitate and finance joint activity and facilities.

A final point that should be made concerns equal treatment of local governments. One way to insure unequal results is to treat them all the same way.

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