

FLOOD RISK MANAGEMENT -- LESSONS IN  
INTER-GOVERNMENTAL ENVIRONMENT AND LAND USE CONTROL

By

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Environmental and Land Use Control<sup>1/</sup>

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Recent changes in flood risk management programs -- many in response to the record 1972 floods -- should provide experience useful to a wide variety of environmental problems where land use controls seem to be at issue. There is a general trend toward expanding the authority of higher levels of government in an effort to increase the consideration of regional, state wide, or national values and reduce the parochial influence of local governments. The recently defeated National Land Use Policy Act might have moved the nation in this direction on a very broad front. As Bosselman and Callies /1972/ point out, many states have adopted a variety of forms of regulatory measures that fit the trend.

This paper will review recent changes in the federal flood insurance program that add new sanctions for regulation of land use in the flood plain. These will be placed in context both with regard to other measures to manage flood risk and with regard to the general problem of inter-governmental influences on land use. Special attention will be given to the potentially key role of the state as exemplified in particular by the complementary legislation passed by New York, but developed in a number of other states as well.

Individuals and communities that occupy the flood plain, acting as separate decision makers, have many incentives to take actions that actually increase the overall risk of flood damage. In spite of millions of dollars spent on flood prevention, flood damage figures seem to increase over the years. A climax came in 1972 with Tropical Storm Agnes, the Rapid City disaster, floods on the Mississippi and in the Pacific Northwest. Losses were in the many billions, with over 350 lives lost and unmeasurable private suffering.

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Building in the flood plain not only poses a risk for the individual but often increases the risk for others. Urbanization can increase the amount and speed of runoff by reducing infiltration. Filling and building too close to the river can cause a previously harmless flood flow to back up and flood much more property. Doing with "yours" or "mine" what we choose can make what is "ours" much more of a problem. The solution is to undertake a variety of public and private actions so that together the risk of flood losses is reduced to more tolerable levels.

### Broad Strategies -- Relief, Flow, Location

In response to disasters such as major floods the nation has evolved a series of relief measures impressive in scope and generosity. Indeed, some who have studied the provisions seem to conclude that a community can't afford not to have a flood. Obviously, some victims would prefer not to have had the honor to be chosen. But the outpouring of assistance to put things back the way they were is one way we spread the risk. Indeed, the cost of flood recovery has been an important incentive to find ways to avoid flood damage.

The 1936 Federal Flood Control Act began a response that put primary emphasis on changing the flow of water. Dams, channel improvements and levees have been installed to give partial protection to most of the cities in the nation. Some argue that the result is to encourage more and unreasonable occupancy of the protected flood plains although there is little hard evidence on the relationship between occupant's risk perception and control devices. But every structural measure has its limits. Millions in damages from floods that are below those limits have been avoided. The protection may be taken for granted and those limits underestimated by developers and local officials alike. Nonetheless, short of redevelopment and relocation, there is little else to be done for many of our existing urban areas. Pittsburgh and most of the urban areas along the Columbia and the Missouri Rivers would have had major damages in 1972 but for the extensive protection works they enjoy.

The major long run solution must be to locate, and relocate, our activities so that they are sensitive to the risk of floods. Some activities are more prone to damage from high water than others. Parks and open space are needed by every urban area -- floodways can provide such amenities. Buildings can be built to minimize water damage, often within the range of existing good construction and design practice. But these adjustments to flood risk apparently won't happen without quite different local knowledge of risks, financial incentives and regulations than we have had. Several recent changes in the politics of water development and resulting program changes give some promise that a new "ball game" is in the making.

What is clear is that no single approach to the problem will "work." Technically, no single approach does it all. Economically, we cannot afford to put enough resources into any one solution. And politically we can't expect to develop enough support for any one program. Perhaps the biggest problem to be faced is the political problem of risk awareness. Right after a major flood many are aware, but the push is to recover, to

get back to normal. As the memories fade, the public will to act fades. The course of action left is to seek to build sensitivity to flood risk into as many of our public actions as possible. For this to happen, private and public advocates of flood prevention are needed at every level of decision making.

### The New Politics of Water Resources

Water development projects have traditionally been fueled with the energy of local support. /Ingram, 1972/ Even though national agencies -- the Corps of Engineers, the Bureau of Reclamation and the Soil Conservation Service -- are the major purveyors of such projects, an examination of their structure of decision making shows that they depend heavily upon local inputs. Local leaders provide much of the information required to define the project and certainly depend upon them to obtain the several essential Congressional approvals required. In the past one Congressman would be reluctant to get involved in the project of another; most participants worked hard to move each project along as all had a positive stake in the process. With many more projects in the pipeline than could be built -- the backlog of authorized projects is well over a decade's investment -- strength of support and lack of local conflict were essential to a priority status.

This has changed with profound effects for flood risk management. Environmental groups in particular are often legitimate participants in the decision-making process. An environmental issue calls forth a constituency that cuts across project areas and Congressional districts. The threat of escalation to a national issue hangs over the simplest traditional project. And environmentalists are unlike more traditional interests who have participated in the past -- the water agencies have had little to offer that they want.

At the same time local leaders and Congressmen have a much wider range of federal programs in which they can participate to do good things for their community. Also more and more state and local agencies are developing the capacity to bring technical expertise to bear on water problems. The water agencies have less of a monopoly in judging the alternatives.

The easy water development choices have been made. As in many of our natural resources, further development along traditional, limited purpose lines can only take place by affecting other interests. Third party or externality effects are increasing. If someone's current use of the resource is not adversely affected, there is now the clearer perception of the prospect of some future option being affected. Many more are affected by resource development decisions. Many more want access to these decisions. The result is increasing levels of conflict surrounding traditional water development projects and lower rewards for many of the participants in the decision process. Congressional interest has fallen off. Budgets have either been static or at least not expanded as fast as have the problems needing solutions.

The prescription for this state of affairs has three parts /Allee and Ingram, 1972/ -- all of which seem to be coming about. First, a

broader bargaining arena would allow more interests to be accommodated. Flood control must be a part of a process that looks at many other concerns -- more than those that can be satisfied by multiple-purpose dams. Second, potential conflicts must be identified earlier. Environmental problems must be surfaced even before the impact statement is written for them to be accommodated successfully. Third, if the agency program mix is expanded it will be easier to find combinations of actions which will attract the necessary support.

#### A Realistic Federal Approach to Flood Plain Management Projects

In section 73 of the Water Resources Development Act of 1974, signed by the President in March, the Congress has signalled that it is willing to seriously consider putting federal funds into non-traditional approaches to flood risk management. It strengthened this signal by authorizing two projects that had not been recommended by the Office of Management and Budget. Essentially, any means to reduce flood risk that can pass the benefit to cost test is now eligible for at least 80 percent funding.

The two unconventional projects authorized are worth thinking about. They represent just the sort of long run solutions that local governments have been unable to implement without outside incentives. Such approaches have been advocated for years but only rarely accomplished and then only with unusual leadership. It is perhaps time to make them the more usual approach.

The Charles River Project is simple enough in principle, prevent the loss of the natural flood storage in the 15,000 acres of wetlands upstream from the flood areas. Filling, draining and building on these wetlands not only reduces the capacity to hold back water, it actually increases the amount and speed of the runoff. But how to keep such development from taking place? Exhortation to local governments to use their land use control powers to protect downstream communities doesn't have much promise. Buying development easements or simply the whole title is a surer approach. Some \$8 million is now authorized to purchase about half of the wetland acreage with the remainder to be acquired by the State of Massachusetts.

In 1970 I wrote the following about the second project authorized:

Prairie du Chien is one of several demonstration projects being developed by the U. S. Army Corps of Engineers that does not involve reliance on conventional structural approaches. In this case it was clear that no structural measures could be justified to protect the some 1,000 Prairie du Chien residents who live on a low-lying island and adjacent mainland areas flooded regularly by the Mississippi River. This project has the potential of developing new federal relocation policies.

Interestingly most of the people involved are either enthusiastic supporters of the concept or at least accept it. The Congressmen, the local officials and many others responded in this way as a result of a carefully developed participation

program. Careful step-by-step exploration of the problems of implementation and liberal doses of imagination and hoped-for funding seem to have produced a successful nonstructural project. If the Congress approves, the city will develop a relocation area on higher ground with assistance from the project. Further the project will spend up to \$1.1 million to move some houses onto new foundations and to buy others for razing. Owners of the houses that will be taken down will be reimbursed to obtain equivalent new homes.

Prairie du Chien's flood plain will become a recreational area with a historic site and two marinas remaining on it. No more disaster relief or flood damage claims or demands for flood control works should stem from this community. Appropriate controls to zone the flood plain against further development are now required and have been since 1 January 1968 when a Wisconsin law was passed to that effect. Indeed, if a local community does not now zone a flood plain, the Wisconsin Natural Resources Department is empowered to write such an ordinance.

This type of approach with its solid program development characteristics and adequate attention to implementing details and compensation is what is needed. But for this to be a real alternative we have to be as equally willing to spend money to achieve it as we are to build dams and channel works. Once we have established that, then the existing rules to require a nonstructural plan and the demonstration that structures recommended are superior to feasible nonstructural approaches will take on some meaning.

It is encouraging to note that at this time the flood problems of the Binghamton area are being reviewed with these approaches in mind. Had Tropical Storm Agnes dumped its 15 inches of rain upstream from Binghamton, only a few miles from Elmira and Corning, the damage from Agnes in New York would have been much greater. The number of urban blocks inundated would have been 600 rather than about 200. The prospect of relocating the activities on that many urban blocks is a bit staggering, but the hope at least is that the practical limits of relocation will be seriously explored.

#### A New Prospect for Small Watersheds

Section 73 of the Water Resources Development Act of 1974 should not be limited to the large project and large problem setting. Small watershed projects usually carried out under PL 566 by the Soil Conservation Service also have the potential of using this authority. Perhaps the Congressional strictures to emphasize farm flood problems in this program can now be eased and some of the untapped potential of the small watershed approach can be realized. In New York the County Small Watershed Protection Districts and the technical and organizational assistance available from SCS and the County Soil and Water Conservation Districts could be used to deal with many vexing small flood situations. These

problems are certainly not confined to small rural communities. Broome County, for example, even under the more limited authorities, has found this to be an effective tool in the Binghamton region.

But the small watershed offers another possible flood-mitigating opportunity. The problem is in having adequate warning that a flood is coming. On many major rivers the Federal Weather Service is able to provide many hours of warning. But where the physical situation is such that six hours or less is the best you can expect, the federal system offers only limited help. A local self-help program using local observations and interpretation is not difficult to design. The few successful efforts -- Olean, N. Y., for example -- indicate the value of such a system. The problem is getting such a system organized and sustained over the years. Watershed organizations are called for, but they need technical assistance and other support that could come from state or federal agencies or perhaps basin organizations like the Susquehanna River Basin Commission that is in fact developing such an effort.

#### Flood Insurance -- The Community Sensitizer

Recent changes in the federal flood insurance program and complementary state legislation should make many more aware of the risks they face as well as encouraging more effective flood plain regulations. Existing development can be covered through private companies by subsidized insurance. Once the detailed data is available to set the rates, all new building must be covered by insurance at full actuarial rates. Before the detailed data is made available by the Federal Insurance Administration, the community must adopt a permit procedure for the designated high risk areas and then the subsidized insurance is made available. Insurance will be required for any mortgage issued on improvements in the high hazard areas by federally regulated or insured financial institutions. Also federal aid, including flood relief payments, in these hazard areas will be limited unless the community qualifies for the program. Qualification requires the adoption of regulations that specify how construction will be made sensitive to the flood risk shown by the detailed data.

The sanctions on individual mortgages and on federal aid to communities, as well as expanded coverage, were added to the program in late 1973 in response to the 1972 flood costs. Available for some years the voluntary approach had attracted only a few communities and very few property owners. While they promise to make the program more effective in discouraging risky use of the flood plain, they will also put the program under very substantial pressure. Particularly the mortgage provisions may raise considerable uncertainty in the land market that will not be dispelled at least until the program is well understood, perhaps not until the final detailed data are made available. It may take as long as a decade for the data to be generated. Communities, like land owners, have been reluctant to label their real estate with the levels of risk calculated by the hydrologists. Also many communities have had major conflicts over the adoption of the kinds of controls called for.

The existence of flood plain information and controls should stimulate interest in other approaches to flood risk management. Dams and channel work should be easier to translate into perceived benefits. Relocation and flood proofing should make more sense to more people.

#### The Need For a Complementary State Program

Higher levels of government influence local actions by grants-in-aid, direct services and mandates. Mandating actions for local governments is constitutionally a state prerogative which obviously may be influenced in turn by various federal inducements. In the case of the flood insurance program it might appear that a formidable set of inducements had been organized to produce effective local flood plain management. However, there is a basis for expecting less than overwhelming results and an understanding of why and how a shortfall between results and expectations may come about should suggest how supplementation should be designed.

In some communities the flood insurance program with its subsidized insurance for existing property, and its sanctions through community grants and individual loans supports a significant existing local interest in land use controls. Proponents of such techniques are reinforced by the requirements and can take advantage of the expertise offered, undercutting opposition by pointing out that the community now has no choice, at least for the flood plain. But what about the communities where no sympathetic local group is significant in local affairs. As others have observed there is reason enough to expect effective filibustering and bargained if not outright noncompliance (Holden, 1966; Derthick, 1970; Ingram, et. al., 1974; Hahn, 1974).

Even with the best of intent most small, usually rural, communities have little expertise to put into a flood plain management effort. Others will not share the objectives of the program and have the capacity to frustrate the intent. This the program proposes to correct by providing all with the data and analysis needed. Rather than a grant to fund the work, the Department of Housing and Urban Development of which the Federal Insurance Administration is a part, will contract to have it done. In the Susquehanna this is being done through the basin commission relieving HUD's strained contract supervision resources. But what about the matching up of ordinance with data, both in the initial drafting of the regulations, their amendment and their enforcement? It remains to be seen how much the Congress will provide for follow-up; the agency resources are not in place at this point. Furthermore, HUD, like any agency dealing with local governments, must seek to maintain good working relations, particularly with the more urban jurisdictions that are most apt to have the capacity needed to negotiate.

Much seems to depend upon the response of the bankers and other federally regulated loan agents. They must determine if a property is within a flood hazard zone and require it to be insured. This should be workable, but puts the pressure on the definition of that zone. Often there is considerable technical latitude in what constitutes a one-hundred year frequency flood zone. There is the problem of evaluating future improvements in channels, effects of dams and the like. But

perhaps the greatest threat comes from the use of variances and permit exceptions by local governments where a series of developments, allowed to encroach on the flood plain, could cumulatively change the size of the hazard zone.

The denial of federal grant aid to the non-conforming community presents a most sensitive problem. These will be grants that both the local people and the granting agencies want consummated. At very least long hours of negotiation can be forecast. The likely intervention of the Congressional delegation will at least involve some awkward confrontations and may pose the threat of legislative modification of the program. And HUD needs to show success in its handling of the assigned responsibility. Substantial pressures exist to find ways to accommodate the recalcitrant communities at some cost to the rigor of the execution of the program. What constitutes an acceptable control ordinance? Must a residence always have its first floor above the 100 year flood elevation? What is acceptable flood proofing for the other uses that may be placed below this level? The scope for bargaining is there.

Compared to most regulatory programs this one would seem to have some features that should make it more successful. Existing property owners may not find the degree of subsidy (up to 90 percent) in the insurance attractive. They certainly didn't flock to their insurance agents in the few communities that became eligible under the sanctionless program. But it may be viewed by other participants in the decision-making process as a significant compensation for the burdens of the program. The water quality grants and enforcement programs would seem to reinforce each other in this way, although the failure to fund the grant side is probably hurting the support for the enforcement side. Also, the popular acceptance of avoiding high flood risk locations would seem to be high -- this is limited by the extent to which high risk is perceived as something less than the hydrologists' 100 year zone.

#### New York's Response to Flood Plain Regulation

Wisconsin has had a mandated flood plain regulation program since 1966. A few other states had followed suit prior to the late 1973 amendments to federal flood insurance program that raised the coverage and added the sanctions. New York had a governor's bill in its legislature in early 1973 that used the Wisconsin program as a model, adding to it features which students of the Wisconsin experience had found desirable (Yaangen, 1972). It essentially provided for a local zoning of the flood plain subject to state guidelines and technical assistance and local enforcement, with the threat of state assumption of either responsibility if not performed adequately. Reaction in the state assembly was to seek a county intervening role between local and state actors to further protect the home rule principle. Interestingly, when the federal amendments became known this was dropped in favor of limiting state intervention to only those communities to be designated by HUD as having flood hazards, and limiting the state to only constraints on flood plain use sufficient to qualify for the federal insurance.

New York has some 1550 local jurisdictions. Of these 960 are towns and the remainder divided between villages and cities. Over 1000 are

expected to be designated by HUD as containing one or more flood hazard areas. How many of these will accept the state's offer to draw up the ordinances and/or enforce them once adopted? While some will find the threat of state intervention and offer of technical assistance a sufficient reinforcement to local interest for land use regulation, there will be those small, rural jurisdictions that will be quite happy to let the state take the heat from their constituents. And some communities which lack building permits and building inspectors now will find it much easier to let the state provide this service than to do it themselves or join with their neighbors or let the county do it.

Technical assistance from the state, however, should facilitate inter-municipal coordination and cooperation. It should provide expertise which can be used to bargain with HUD. Professional values in implementation, uniformity between jurisdictions, linkages to other flood risk and water management alternatives and plans should be enhanced. If adequate resources are forthcoming it should be possible to monitor the cumulative effects of exceptions and variances, and at least give the local land use regulators access to the knowledge of such effects, if not reinforcement in its application. It would seem that the likelihood of two agencies (HUD and the state) finding enough resources between them to do the needed follow-up would be greater than if only one of them were involved.

However, it should be noted that the greatest advantage in state involvement may be in the constitutional question of who has the authority to mandate a local government action. It should be clear under the New York statute that local compliance is indeed mandated. This is an addition to the incentive of the federal sanctions.

Similarly, the use of the police power to achieve flood plain regulation should be enhanced at least insofar as any challenges based on the taking issue are usually not as important to the use of the police power as is the attitude of the enforcing officials, nonetheless it is not without significance. Now the state is more likely to be a party to the action. Also it is clearer to the courts that this is a socially sanctioned use of the police power; cause and effect should be more clearly identified; at least to the extent of the subsidy for insurance on existing buildings some compensation is provided, and although the cost is affected there is no particular prohibition on uses of land similar to those on surrounding parcels. While these are points that have sustained land use controls in the past, and exist technically under the federal program alone, they should be strengthened in the court's eyes by being reinforced by a state legislative act.

#### Flood Risk Management as an Example of Step-by-Step Policy Development

Public policy changes come in a series of incremental steps, rarely in large sweeping reforms. /Lindblom, 1958/ It is easier to get agreement for proposals for limited changes where the remedy is well defined and clearly linked to a particular problem. A national land use policy act or a comprehensive state land use control program is much more difficult. Uncertainty about who will be affected and how is enough to cut

the chances for support. Agricultural Districts, or protection for tidal wetlands, or a Stream Protection Act, or a flood plain management bill, offer approaches that attract support. Several problems are posed by this process that should be recognized particularly by community and environmental leaders.

First, this is a remedial process of diagnosis and prescription. Changes in programs are made and their effect should be assessed -- not only on the direct objective but on side effects as well. The response to the changes will first come from those who have a direct, immediate and tangible stake. Those who are affected less directly, in smaller ways, and less tangibly, will react more slowly if at all. And in today's fast moving world the "turn around time" for revising program changes is much shorter. This increases the burden on those who would represent the broader, more diffused interests.

Second, it is increasingly difficult to see how these many programs fit together, where they complement each other and where they counteract each other. It may be harder to do this at the higher levels of government than at the lower; the system is so complex, and responsibilities so specialized. Yet the local community seems to have so many constraints placed upon it from outside. Again a special challenge is put to our community and environmental leadership to know their local situation and to take responsibility for getting it reflected and understood at higher levels of decision making.

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