

# Involving citizens in hazard mitigation planning: making the right choices

## Introduction

In addition to knowing what to do to mitigate losses from natural and technological hazards, local governments also must develop a commitment to take action. Commitment, however, often has been lukewarm, resulting in plans and proposals that no matter how technically proficient are either dead on delivery or produce minimal effort. By making the right choices about citizen involvement in mitigation planning, emergency managers can build an informed constituency for mitigation and real commitment among elected officials to take action.

Key choices include decisions about:

- objectives to be achieved by involving citizens
- points in the planning process when citizens participate
- which citizens to include
- techniques to be employed in securing citizen input
- information to be provided to citizens.

## The problem

Substantial progress in reducing losses from natural and technological hazards will not occur until local public officials become informed about and committed to dealing with this policy problem. The importance of commitment in policy formulation and implementation has been widely noted by policy scholars. In the case of natural and technological hazards, however, researchers have found that local commitment to take action can be weak or missing entirely (Burby and May 1998; Rossi et al. 1982). In this article, I argue that by paying more attention to citizen involvement in hazard mitigation planning, emergency managers can build a political constituency, which will work to see that the recommendations for hazard mitigation made in plans are subsequently implemented. To be successful with this, managers need to make the right choices in their efforts to involve citizens.

Hazard mitigation requires local policy makers to develop and follow new ways of managing development and redevelopment processes, but public officials develop patterns of policy making over time that are difficult to change (Cobb

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and Elder 1972; Eulau and Prewitt 1973). The need to overcome inertia in local policy provides one justification for hazard mitigation mandates from higher-level governments (May et al. 1996). But, if the mandates do not substantially change rewards and penalties facing local policy makers, decision-making about mitigation is not likely to change. In fact, local policy makers often see few rewards from dealing with hazards because their individual constituents are not inclined to worry (or even think) about such low probability events or demand governmental attention to them (Kartez 1989; May 1991). Without positive signals from their constituents, politicians, who themselves do not see the problem as very serious, are unlikely to adopt policies to reduce risks from hazards. If the signals are all negative, they may actively resist national and state prescriptions to regulate activities in areas at risk (Ripley and Franklin 1982).

These obstacles can be overcome if there is an active constituency advocating for hazard mitigation. To create such a constituency, planners have to (1) ensure that stakeholders are aware of the costs they may incur in disasters and (2) develop consensus about ways of reducing or avoiding the most serious risks. Constituency building of this sort requires a collaborative, participatory planning process in which a key goal is social learning. That is, the various stakeholders in hazard mitigation (what political scientists term a 'policy network') need to be both informed of the potential costs of unsafe development in hazardous areas and convinced that alternative approaches to development are reasonable for all concerned interests. If some degree of consensus or policy convergence can be attained, then the

political support needed to sustain local commitment to hazard mitigation may be secured.

## Citizen involvement in hazard mitigation planning

A large (and growing) literature advocates citizen involvement in planning and, more generally, local public policy making, but various authors also have suggested there are a number of potential barriers that must be dealt with if citizen involvement efforts are to be effective in constituency building.

Widespread participation, for example, is viewed by some authors as administratively unworkable and as a potential cause of heightened conflict rather than consensus over appropriate courses of action (Day 1997). Others have noted various difficulties citizens have in participating effectively, ranging from apathy and lack of resources (skills, money, time) to inability to comprehend issues as complex as hazards (Almond and Verba 1965; Kartez 1989; Verba 1967). Other barriers include lack of governmental resources for, and time to engage in, citizen involvement processes and lack of government staff with knowledge about how to carry out an effective public involvement program (Catanese 1984). These factors create the potential for a large gap between what theorists and educators argue for as best practice and what actually occurs in local government planning and policy making. In fact, one recent study concluded, 'Standard participation efforts are often characterised by lengthy meetings, limited opportunities to comment, narrowly defined choices on which to comment, meeting fatigue or indifference on the part of those who run meetings, limited opportunities for dialogue, and an emphasis on informing or educating rather than problem solving' (Lowry et al 1997).

While citizen involvement can be difficult, if emergency managers make the right choices in involving citizens in the preparation of hazard mitigation plans, they can overcome many of the barriers that have contributed to limited success in the past.

The choices I think are most relevant

to the efficacy of citizen involvement include:

- objectives
- timing
- participants
- citizen involvement techniques
- information given to citizens.

In the remainder of this article, I examine these choices by noting first what theorists have to say about each of them and then looking at the choices made by emergency managers in the U.S. in preparing hazard mitigation plans. I also report the consequences of choices made in terms of the degree that actions recommended in plans were subsequently adopted.

### Data

The data reported come from a nationwide survey of planners involved in preparing floodplain management plans to qualify for flood insurance rate reductions under the U.S. National Flood Insurance Program. Responses were obtained from planners working in seventy-four localities (67 percent of the U.S. total of 110 floodplain management plans that had been prepared as of 1999). Two types of analyses are reported. Descriptive statistics report the percentage of local governments that made particular choices in the planning process. Impact statistics indicate the consequences of choices made in terms of the percentage difference the choice made, in the actual implementation of hazard mitigation measures in the jurisdiction.<sup>1</sup>

### Choice number one: objectives

Burke (1968) notes that citizen involvement efforts frequently fail to meet

expectations because objectives are not formulated and participation is simply appended to on-going technical planning processes. As important as it is to have objectives, it also is important to choose the right ones. Potential objectives for citizen involvement include:

- complying with state government requirements regarding due process and citizen opportunities to voice their opinions about government proposals.
- educating and informing citizens about hazards and ways of dealing with particular hazards problems
- tapping citizen knowledge of and experience with hazards as a supplement to technical studies
- learning about citizen preferences for courses of action to deal with hazards
- mobilising an active constituency of citizens who would support programs and policies proposed in hazard mitigation plans
- fostering citizen influence in hazard mitigation decision-making through a collaborative planning process.

Although it is attractive to technically minded planners to limit efforts to involve citizens to the minimum required by state governments, clearly the first objective is not likely to help in building a constituency for mitigation. Most planners would agree that the second objective—providing citizens with information—is essential, if citizen involvement is to have any impact. Each of the remaining objectives is also likely to contribute to constituency building, although planning theorists recently have emphasised the sixth objective—collaboration—as absolutely essential.

Several authors (Arnstein 1969; Connor 1984; Glass 1979) view the choice of objectives in terms of a ladder of participation, on the assumption that the greater empowerment of citizens associated with a collaborative approach is normatively superior to the one-way communication (planner to citizen or citizen to planner) that characterises other citizen involvement objectives. Many planning scholars also now believe that the sixth objective—working collaboratively with citizens—is important for substantive reasons as well.

In their view, collaboration can:

- help citizens better understand information
- generate new ideas for dealing with problems
- lead to greater consensus on courses of action to deal with them
- produce greater long-term support for policy recommendations proposed in

plans (see Barber 1981; Godschalk et al. 1994; Healy 1996; and Innes 1996).

Contrary to the arguments made by theorists, some U.S. hazard mitigation plans (20 percent) were prepared without consciously setting objectives for citizen involvement and others were guided by a very limited number of objectives. A typical jurisdiction (at the median of the sample) chose to emphasise only two goals for citizen involvement: educating citizens about hazards and complying with state requirements for citizen participation (see *Table 1*). As a result, plans prepared had less impact than they otherwise might have had.

When planners pursued three or more of the six objectives outlined in *Table 1*, their jurisdictions adopted 55 percent more mitigation measures than was the case in jurisdictions where no or only one objective was pursued. *Table 1* also shows that the theorists appear to be right about the choice of specific objectives. The greatest percentage increase in adoption of mitigation measures came from planning processes in which the planners emphasised 'fostering citizen influence in hazard mitigation' (76 percent increase in adoption of mitigation measures in comparison with jurisdictions that did not emphasise this objective), 'learning about citizen preferences' (70 percent increase in mitigation measures adopted), and 'mobilising an active constituency of citizens who would support programs and policies proposed in the plan' (42 percent increase).

### Choice number 2: timing

Emergency managers have several options regarding timing in developing citizen involvement programs. One alternative is to ignore this question. However, if timing is not planned in advance, participation may be ad hoc, as when citizen involvement takes place not as a result of forethought but in response to citizen demands that their views be considered. This can result in an adversarial atmosphere that is not conducive to constituency building. If the timing of participation is planned, then planners have to decide when in the planning process to begin involving citizens.

The decision about timing is related to the objectives sought from citizen involvement. If the objectives are simply to comply with state requirements or to educate citizens, then citizen involvement could be limited to meetings and formal public hearings at the end of the planning process. However, if an objective is to tap citizen knowledge, public involvement

### Notes

1. Respondents were asked whether any of eighteen different hazard mitigation measures were adopted after preparation of their floodplain management plan. These measures include: publication of maps of hazard areas; warning systems; public hazard awareness campaigns; mandatory inclusion of hazard boundaries on subdivision maps; requirements for special studies of hazards as a condition for development approval; site plan review to determine if hazard mitigation conditions should be required as a condition for development approval; regulations requiring low-density land use in hazard zones; reduction in allowable density in hazard zones; overlay of special hazard mitigation requirements for development in hazard zones; provision for clustered development in hazard zones to avoid the most hazardous portions of development sites; transfer of allowed density from hazard zones to hazard-free sites; density bonuses in return for dedicating hazard zone property to the public; mandatory dedication of hazard zone property to the public; impact fees on hazard zone development to cover public hazard mitigation costs; policy to locate public facilities outside of hazard zones; public acquisition of hazard zone property; relocation of structures from hazard zones; and levees, sea walls, flood control works, and other engineered structures to minimise hazards.

should take place early in the planning process. If the objective is to garner citizen feedback on planning proposals, it might be postponed to the point when planners are developing and evaluating action items and recommendations. If, however, the goal is collaboration with citizens and constituency building, then citizen involvement should begin early and be continuous throughout the planning process.

The choices about timing made by U.S. hazard mitigation planners are reported

in **Table 2**. In the largest proportion of planning processes (44 percent) citizen involvement was limited to a planning committee (that is, there was no formal citizen involvement process) or to formal public hearings on the plan after it had been prepared. Just under a third (31 percent) saw citizens involved for the first time when choices were being made among action items and recommendations. Only a quarter of the planning processes involved citizens from the start.

For the most part, U.S. hazard

mitigation planners matched the timing of citizen involvement to their objectives. For example, two thirds of those who emphasised compliance with state requirements or educating citizens involved citizens late in the planning process. In contrast, when planners tapped citizens for their knowledge about hazards, worked to foster citizen influence in decision-making, or to mobilise a supportive constituency, a majority involved citizens from the very first stages of the planning process. As shown in the right hand column of **Table 2**, early involvement of citizens paid large dividends in subsequent adoption of hazard mitigation measures. Local governments that involved citizens early adopted 85 percent more mitigation measures than those that initiated citizen involvement at a later stage.

### Choice number three: participants

Those who write about citizen involvement in planning generally argue that participation should be widespread and inclusive, so that consensus can be developed over appropriate courses of action through communication among all affected groups (e.g., see Godschalk et al 1994; Healy 1996; and Innes 1996). Those that have observed policy formation in the hazards field, in contrast, have observed that decision-making typically does not involve mass publics, but instead tends to be limited to government officials and the professional community (e.g., see May and Stark 1992). This latter perspective tends to be an accurate description of the choices made by hazard mitigation planners in the U.S. In over a quarter of the planning processes examined, citizens did not participate at all prior to public hearings at the end of the planning process (see **Table 3**). Instead, participation was limited primarily to local elected officials and representatives of various government departments. Beyond government personnel, a typical planning process (the median community) involved just two interest groups; but, contrary to arguments for widespread participation made by planning theorists, the more limited participation that characterises hazard mitigation planning in the U.S. has not adversely affected the adoption of hazard mitigation measures recommended in plans. Local governments that secured widespread participation in the preparation of hazard mitigation plans were only slightly more successful in seeing mitigation proposals acted upon than those where partici-

Choice of objectives	Percent of jurisdictions emphasizing objective	Impact on adoption of mitigation measures <sup>a</sup>
<i>Number of objectives pursued</i>		
Low (0 or 1 objective emphasised)	44	(base case)
Medium (2 objectives emphasised)	28	+20%
High (3 or more objectives emphasised)	28	+55%
<i>Specific objectives pursued</i>		
Educating citizens about flood hazards	70	+25%
Complying with state requirements	38	+ 03%
Fostering citizen influence in hazard mitigation decision making	22	+76%*
Tapping citizen knowledge and experience	20	+12%
Mobilising an active constituency of citizens who would support programs and policies proposed in plan	20	+42%
Learning about citizen preferences and values	19	+70%*

N = 74 local governments that prepared hazard mitigation plans for credit under the National Flood Insurance Program Community Rating System Program.

\* p < .05 in difference of means test between localities that emphasised each objective and those that did not emphasise the objective.

<sup>a</sup> Impact is the percentage increase or decrease in the number of hazard mitigation measures adopted after preparation of a hazard mitigation plan for jurisdictions emphasising each objective from the mean of the sample of jurisdictions not emphasising the objective. The group mean is 2.2 additional hazard mitigation measures adopted following preparation of a hazard mitigation plan.

Table 1: Choice 1 – objectives

Choice of stage	Percent of jurisdictions choosing stage	Impact on adoption of mitigation measures <sup>a,*</sup>
No formal public involvement program – planning committee only used for public input	9	(base case: 1.8 measures adopted)
Post-planning: formal public hearing on plan	35	-15%
Planning: development and evaluation of action items and recommendations	31	+19%
Pre-planning: scoping and development of work program	25	+85%

N = 74 local governments that prepared hazard mitigation plans for credit under the National Flood Insurance Program Community Rating System Program

\* p < .05 in difference of means test among all stages.

<sup>a</sup> Impact is the percentage increase or decrease in the number of hazard mitigation measures adopted after preparation of a hazard mitigation plan for jurisdictions choosing to first involve citizens at each stage of the planning process from the mean of the sample of jurisdictions choosing to limit citizen involvement to a planning committee only. The group mean is 2.2 additional hazard mitigation measures adopted following preparation of a hazard mitigation plan.

Table 2: Choice 2 – stage of the planning process when citizens become involved

pation was limited to government officials and a few groups of stakeholders.

Several other aspects of the choice of participants have drawn considerable attention. Historically, citizen involvement processes have been viewed as ways to empower citizens whose views are often not considered in local government decision-making. Empowerment was a key consideration in early federal citizen participation requirements in the U.S., such as those embodied in the Economic Opportunity Act of 1964 and Model Cities program of 1966, and the degree to which it occurred dominated evaluations of

those programs. This still could be an important consideration, since citizen involvement may be meaningless if 'collaborative processes merely end up being conversations among elites, new forms of an old corporatism... as opposed to real attempts to involve multiple stakeholders' (Healy 1996). Nevertheless, as shown in **Table 3** groups representing disadvantaged citizens actively participated in only 10 percent of the hazard mitigation planning processes examined, and groups advocating for affordable housing took part in only 1 percent. As with mass participation, however, the

exclusion of disadvantaged groups did not limit subsequent adoption of mitigation measures proposed in plans. Of course, whether the plans were equitable in the distribution of costs and benefits of mitigation is an open question.

Godschalk et al (1998) note that it is important to involve officials who are likely to be making decisions about hazard mitigation and people who are likely to be affected by mitigation choices (primary stakeholders). The choices planners made in this regard are also shown in **Table 3**. Most planning processes brought in local elected and staff officials, which tended to enhance the subsequent adoption of mitigation measures. Many also involved interested state and federal agencies, but whether or not those agencies were involved had little effect on subsequent action on proposals made in plans.

Less than a majority of the planning processes involved any of the other stakeholder groups I asked about. Groups planners were most likely to involve included representatives of the media, neighbourhood groups, and development and business interests. May and Stark (1991) note, in addition, that in the case of hazard mitigation policies, participation by interested professional groups, such as associations of civil engineers and architects, may be critically important. At the national level, for example, these groups have been found to be particularly important in disseminating and fostering the use of information about natural hazards. At the local level, few planning processes (less than a quarter) obtained participation by groups representing relevant professions. Participation was also infrequent by groups representing environmental interests, resource industries such as agriculture and forestry, and sports, outdoor, and recreation interests. The impact data in **Table 3** suggest that the failure to include some of these latter groups could be costly. The likelihood that mitigation measures proposed in plans would be adopted was substantially enhanced when professional, environmental, resource industry, and sports, outdoor, and recreation groups took part in the planning process.

#### Choice number four: techniques

A number of techniques have been developed to foster citizen involvement in planning. There seems to be general agreement that public hearings have a variety of flaws as a participation technique (Benest and Erlewine 1993; So et al 1986), but there is little information

Choice of participants	Percent of jurisdictions with participation by group	Impact on adoption of mitigation measures <sup>a</sup>
<i>Number of types of citizen groups involved</i>		
Low (0 citizen groups involved)	28	(base case)
Medium (1-3 citizen groups involved)	45	-3%
High (4 or more citizen groups involved)	27	+4%
<i>Types of groups involved in the planning process</i>		
<i>1. Disadvantaged groups</i>		
Groups representing disadvantaged people exposed to flooding	10	-.17%
Groups advocating for affordable housing	1	-10%
<i>2. Public officials</i>		
Local staff personnel	88	+36%
Local elected officials	74	+36%
Regional water resource officials	38	-18%
State flood insurance program coordinator	49	+03%
State emergency management agency official	39	+05%
State water resources agency official	28	-07%
Federal Emergency Management Agency personnel	41	+09%
U.S. Army Corps of Engineers personnel	31	-06%
U.S. Geological Survey personnel	11	+08%
<i>3. Stakeholder and other groups</i>		
Media	44	-21%
Neighbourhood groups	42	+08%
Development groups (homebuilders, etc.)	35	-15%
Property owner groups	35	-04%
Business groups (Chamber of Commerce, etc.)	32	+14%
Professional groups (engineers, architects)	23	+37%
Environmental groups	13	+29%
Port, fishing, and marine industry groups	6	+01%
Agriculture and forest industry groups	4	+21%
Sports, outdoor, and recreation groups	1	+129%
N = 74 local governments that prepared hazard mitigation plans for credit under the National Flood Insurance Program Community Rating System Program		
* p < .05 in difference of means test – localities in which group participated vs. those where group did not participate. (Note: none significant in this table.)		
<sup>a</sup> Impact is the percentage increase or decrease in the number of hazard mitigation measures adopted after preparation of a hazard mitigation plan for jurisdictions in which group participated versus jurisdictions in which group did not participate. The overall group mean is 2.2 additional hazard mitigation measures adopted following preparation of a hazard mitigation plan.		

Table 3: choice 3 – whom and how many to involve

available about the importance of choices emergency managers make among other techniques. Most of the literature on the subject is either merely descriptive of techniques or advocacy pieces based on limited experience.

**Table 4** provides a list of eight techniques for securing citizen input. Public hearings, used by over 80 percent of the planning processes examined, are the most widely used approach, and a majority of planning processes also employed open meetings and facilitated meetings. Less frequently employed techniques include citizen advisory committees, subcommittees and workgroups, interviews with key stakeholders, household surveys, and telephone hotlines. The impact analysis indicates that with the exception of telephone hotlines, most of these techniques lead to improved prospects that measures proposed by plans will be subsequently adopted and used. In addition, prospects for adoption improved when planners used a wider variety of citizen involvement approaches. This may stem from the fact that each approach is likely to result in participation by a somewhat different group of citizens and will produce somewhat different information and outcomes. Key stakeholders, for example, may not attend public meetings, but their views can be tapped through personal interviews. Advisory committees and workgroups provide opportunities for intensive interaction between citizens and planners and make it possible to discover consensual courses of action. Household surveys help guarantee that input is received from a representative cross-section of citizens. Open and facilitated meetings and public hearings provide opportunities for citizens who have a strong interest in mitigation to make their views known. When more citizen involvement techniques are employed, planners increase the likelihood that different groups' views are considered and reduce the likelihood that controversy and community conflict will develop over proposals made in mitigation plans.

#### Choice number five: technical information

For participants to make or influence decisions competently, they must have access to adequate information about hazards, vulnerability, and hazard mitigation options. Information is empowering, and, hence, access to it is often a political dimension of planning processes. Adequate technical information is an especially vexing and perverse

Choice of techniques	Percent of jurisdictions using technique	Impact on adoption of mitigation measures <sup>a</sup>
<i>Number of techniques used:</i>		
Low (0-2 techniques)	33	(base case)
Medium (3-4 techniques)	35	+29%
High (5-7 techniques)	32	+76%*
<i>Specific techniques used:</i>		
Public hearings	82	+44%
Facilitated workshops/meetings	65	+33%
Open meetings	61	+05%
Citizen advisory committee	47	+75%*
Subcommittee or workgroups	32	+19%
Interviews with key stakeholders	28	+30%
Household surveys	26	+53%
Telephone hotline	19	-18%
N = 74 local governments that prepared hazard mitigation plans for credit under the National Flood Insurance Program Community Rating System Program		
* p < .05 in difference of means test – localities where technique was used vs. those where technique was not used.		
<sup>a</sup> Impact is the percentage increase or decrease in the number of hazard mitigation measures adopted after preparation of a hazard mitigation plan for jurisdictions in which group participated versus jurisdictions in which group did not participate. The overall group mean is 2.2 additional hazard mitigation measures adopted following preparation of a hazard mitigation plan.		

Table 4: choice 4 – techniques for involving citizens

problem in hazard mitigation. Many local governments have little information about vulnerability (Burby et al 1991), and lay people as well as professional constituencies often ignore such information when it is available, unless hazards are tied to other salient issues. As a result, Faupel and Kartez (1996) argue that public education about hazards (including that developed for constituencies such as developers, designers, and key agencies) should always be emphasized in emergency management. I believe that empowering citizens with information is also an essential element of hazard mitigation planning. The two key choices here are ones of information content (does the locality provide important information about vulnerability to hazards?) and of access (are participants being given it actively and in a form they can use?).

Among the seventy-four hazard mitigation planning processes examined for this study, more than 90 percent provided citizens at least one type of information. The jurisdiction at the median of the sample provided three. Types of information disseminated by a majority of these planning processes included maps delineating hazard areas, summaries of plan elements or issue areas, and goal or vision statements (see **Table 5**). The more types of information planners provided during the planning process, the more likely recommendations proposed in

plans were to be subsequently acted upon. Types of information that had particularly strong associations with the adoption of hazard mitigation measures include the provision of projections of future development expected in hazard areas, goal or vision statements, and information on alternative designs and strategies being considered. With each, the proportion of mitigation measures adopted increased by over 50 percent in comparison with planning processes that did not provide that information.

Different groups tend to attend to different channels of information. Thus, to adequately reach citizens, it is important for planning processes to disseminate information in a variety of different ways. This is well illustrated by the data in the bottom section of **Table 5**. The number of hazard mitigation measures adopted after plans were prepared more than doubled when planners used three or more channels to disseminate information to the public. The channels used by a majority of planning processes—educational workshops, talks to community groups, brochures, and newsletters—is each associated with marked improvement in the chances that measures proposed in plans would be adopted and used.

#### Conclusion

Citizen involvement can be critical to the success of hazard mitigation plans and

mation about vulnerability to hazards and hazard mitigation goals and policy options and then ensure that it is accessible to citizens by using a variety of channels for dissemination.

The choices planners face in developing citizen involvement programs are complex. In this article, I have shown that careful attention to making the right decisions in involving citizens can result in more effective plans—plans that are not dead on delivery and actually produce measurable results. In short, when local governments devote the time and resources needed to plan with citizens, they realise far more effective plans than when planning is conducted solely as a technical exercise involving only experts.

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Choice of information channel/type of information	Percent of jurisdictions	Impact on adoption of mitigation measures <sup>a</sup>
<i>Types of information provided</i>		
Number of types of information provided		
Low (0-1 types of information)	32	(base case)
Medium (2-4 types of information)	33	+29%
High (5-7 types of information)	35	+76%*
Specific information provided:		
Maps showing flood-hazard areas	82	+43%
Summaries of plan elements or plan issue areas	60	+16%
Goal or vision statements	54	+64%*
Alternative design or strategy statement	32	+56%*
Vulnerability assessments	31	+28%
Summaries of survey or meeting results	21	+33%
Projections of development in hazard areas	18	+86%*
<i>Channels used to provide information to citizens</i>		
Number of channels used:		
Low (0-2 techniques)	32	(base case)
Medium (3-4 techniques)	33	+111%*
High (5-9 techniques)	35	+116%*
Specific channels used:		
Educational/informational workshop	56	+94%*
Talks to community groups	54	+35%
Brochure	54	+51%
Newsletter	54	+50%
Newspaper inserts	47	+21%
Bill stuffers (in utility bills, etc.)	39	-26%
Public access cable television	24	+13%
Website	21	+08%
Videos	11	+49%

N = 74 local governments that prepared hazard mitigation plans for credit under the National Flood Insurance Program Community Rating System Program

\*  $p < .05$  in difference of means test-localities that provided type of information vs. those that did not.

<sup>a</sup> Impact is the percentage increase or decrease in the number of hazard mitigation measures adopted after preparation of a hazard mitigation plan for jurisdictions emphasizing each objective from the mean of the sample of jurisdictions not emphasizing the objective. The group mean is 2.2 additional hazard mitigation measures adopted following preparation of a hazard mitigation plan.

Table 5: choice 5 – channels used to disseminate information to participants and types of information provided

programs, since it is the key to creating a strong local political constituency for mitigation. Emergency managers, however, face a number of choices in deciding how to involve citizens in the planning process. In this article, I have reviewed evidence from floodplain planning processes in the U.S. to provide some guidance about how to proceed. First, establish clear objectives about what is to be achieved through citizen involvement. Programs are more effective in developing supportive constituencies when they consciously seek to collaborate and empower citizens and when they pursue a broader range of objectives for citizen involvement. Second, time participation so that it reinforces the chosen objectives.

Where constituency building is an objective, plans are more effective when citizens are involved from the beginning stages of the planning process. Third, involve stakeholders, government officials, and professional experts, and do not ignore groups, such as environmental, resource industry, and outdoor recreation interests, who will advocate for open space uses of particularly hazardous areas. Fourth, carefully consider participation techniques and choose those that best fit the objectives sought through participation and the resources available. At a minimum, do not limit involvement to a public hearing, which provides little opportunity to develop a dialogue with citizens. Finally, develop adequate infor-

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## Conference Announcement

### Third International Conference on Computer Simulation in Risk Analysis and Hazard Mitigation. RISK 2002

June 19-21, 2002. Sintra, Portugal, Organised by Wessex Institute of Technology.

The analysis and management of risk and the mitigation of hazards is essential. The advances in computational methods and the ability to model systems more precisely now enable hazards to be quantified, their effects to be simulated and risk analysis to be pursued with greater accuracy, providing far more effective risk management. These developments are not only important for all areas of human endeavour, but have particular relevance to environmental issues where the risks involved are increasingly seen as substantial. Effective risk management and the mitigation of possible hazards have become a high priority of government concern.

#### Topics to be covered

Hazard prevention, management & control, Estimation of risks, Emergency response, Data collection & analysis, Hazardous materials in

transit, Water resources modelling & management, Landslides, Earthquakes, Soil & water contamination, Air quality studies, Damage remediation, Risk associated with Brownfield Developments, Waste disposal risk, Floods & droughts, Coastal & sea pollution, including oil spills, and Case studies

#### For more information

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