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FLOOD INSURANCE AND COMMUNITY PLANNING

Adoption of the Federal Flood Insurance Program in Two Texas Communities

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PREFACE

This paper is one in a series on research in progress in the field of human adjustments to natural hazards. It is intended that these papers will be used as working documents by the group of scholars directly involved in hazard research as well as inform a larger circle of interested persons. The series was started with funds granted by the U. S. National Science Foundation to the University of Colorado and Clark University but now is on a self-supporting basis. Authorship of papers is not necessarily confined to those working at these institutions.

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THE NATIONAL FLOOD-INSURANCE PROGRAM: COMMUNITY RESPONSIBILITY

Current status of Flood-plain Controls

Although the National Flood-Insurance Act was passed in 1968, it was not until 1970 that the State of Texas passed the necessary enabling legislation permitting communities to act individually in passing the regulations necessary to become eligible to enter the program. Since that time, only 118 (11 percent) of approximately 1,008 Texas communities with flood problems have entered the insurance program. On a national basis, out of an estimated total of more than 5,000 flood-prone cities and towns, 547 communities (10 percent) were enrolled in the program and had enacted the minimum requirements for land-use control; 1,892 were pending admission into the regular program as of late 1973 (U.S. Dept. of Housing and Urban Development, 1973).

Clearly, Texas has made progress in the last four years in regulating flood-prone lands and adopting a flood-insurance program. However, many communities, both in Texas and other states, have delayed action in this area because of problems in initiating, enforcing and sustaining the required land-management techniques.

Community Adoption: Potential Setbacks

One critical area may be collecting and analyzing the hydrological data required for the deliniation of a flood plain and the determination of flood-way requirements, a step which involves studies of past and probable future flood flows, characteristics of the

floodway and the potential modification of the floodway. The technical experience for making such studies may be lacking on most planning boards and city or county engineering staffs. However, assistance usually is available through federal agencies such as the Soil Conservation Service and the U.S. Army Corps of Engineers, though the time lag between requisition and completion of the study may be significantly burdensome.

Another potential obstacle to community adoption may be a public that has historically favored development almost irrespective of the cost from floods. Personal property rights are highly valued; landowners expect to be able to develop their property as they choose. Those of considerable prestige and influence in the community may oppose controls which they view as limiting the economic development of their investments.

Zoning, frequently used to regulate the flood plain, is one example of yielding private property rights to a public need. Some studies have shown that when land-use control decisions are made, they are representative of a concensus within the local power structure (Castle and Retting, 1972). Often, whose interests will be considered is contingent upon an individual's or group's resources (popularity, authority, money or public support) (Gamson, 1968). The purpose of this paper is to report on the analysis of the local power structure in the decision to adopt flood-plain regulations in New Braunfels and Sequin, Texas.

Two Texas Communities: Appraisal of Management Programs

This study of community adoption of the Federal Flood Insurance

Program was undertaken to complement an investigation of individual adoption of flood insurance (see Baumann, 1974). Since community eligibility for the program must first be established before homeowners or businessmen may purchase federal flood insurance, it is important to examine the collective-decision process in relation to the flood-insurance program in order to identify potential and actual problems in the adoption of the program.

In an effort to understand how and with what difficulties community decisions are reached in the formulation and implementation of flood-plain regulations, two lines of inquiry may be of particular significance. The first envisages the structure of community power as decisive; what groups and individuals are involved in the decision may determine what decisions are made. The second focuses on the individual characteristics of those who exert influence over the decision; the perceptions and values of these influentials may be explanatory variables with respect to their stand on land-use policy innovations. For instance, such factors considered to be important were; (1) judgement of the attributes of flood-plain regulations, i.e., relative importance, compatibility and relative advantage; and (2) the personal value orientations of the influentials, i.e., change values and economic norm values.

Study Procedure

A study with similar research objectives had been undertaken in two midwestern cities: Evanston, Indiana, and Carbondale, Illinois (Simkowski, 1973). To provide comparability to this earlier study, similar research procedures were employed:

(1) A community data profile was compiled including population, flood-damage experience and frequency, formal government organization, various published community plans, and newspaper items concerning activities along the principal waterway;

(2) the Issue Specific Reputational Survey was administered to a group of predetermined informants to assess their perception of who had been influential in the land-use regulation decisions along the flood plain; and,

(3) a general interview schedule was administered to the identified community leaders to assess their perception of the flood problem, their evaluation of adjustments to the hazard and their knowledge of the process and problems encountered in the adoption of flood-plain regulations. The instrument also included a series of statements designed to measure propensity for change and concern for economic development, in addition to the influentials' assessment of the Federal Flood Insurance Program and the Canyon Dam Project in the area.

The Political Innovation-Adoption Process

Elements of the Process

The political innovation-adoption process is conceived of as a process consisting of a number of interrelated activities and procedures (phases) in which a variety of groups, organizations and individuals are involved. Consideration, acceptance and implementation of flood-plain regulations are one adjustment to the flood hazard that is dealt with through collective decision-making.

Insight into the process by which, and the stage at which, local interest groups or individuals seek to inject their interests into

land-use decisions may expedite compliance with community goals regarding land development.

This section will focus on the process of adoption of flood-plain regulations and will provide a discussion of each phase of the process, the actors involved, and the obstacles. The political innovation-adoption process is conceived of as having four stages: (1) awareness of need, (2) persuasion and evaluation, (3) decision, and (4) implementation. Within this framework, a discussion of the characteristics, attitudes and judgments of the key leadership figures will be presented.

Awareness-of-need Phase

At this stage in the decision process, the initiator (or initiating set) plays the role of suggesting to the responsible decision body the need for the innovation.

The city governments of Seguin and New Braunfels received a letter from the Federal Insurance Administration of the Department of Housing and Urban Development (HUD) giving formal notice that their communities might contain one or more areas having special flood hazards. The letter described the availability of subsidized flood insurance, authorized under the National Flood Insurance Act of 1968, and the land-management requirements the city would have to meet to qualify for the program. Availability of subsidized insurance may have been a strong inducement for community action.

When interviewed, 83 percent of the supporters and 100 percent of the opposers of the flood-plain regulations stated that the benefits of the subsidized insurance program were the primary reason in proposing

the land regulations. Therefore, the federal agency, HUD, appears to have aroused public awareness of regulating flood-plain developments as an adjustment in mitigating future flood losses.

After receipt of the letter from HUD, the mayors and city managers of the two cities took steps to evaluate the range of alternatives of flood-plain regulations. The city council, with input from residents, had to formulate a flood-plain program.

As the first step in policy deliberation, the extent of the flood problem needed to be assessed. Flood-boundary maps were requested of the Soil Conservation Service by both cities, though considerable time passed before their receipt. Delays in getting the maps prevented the city councils from taking any firm action on the regulation proposal; nevertheless, in the meantime, under emergency status, residents in both communities could purchase flood insurance.

Persuasion-and-evaluation Phase

Flooding of 1972

While New Braunfels was deliberating what type of regulations should be adopted, the May, 1972 flood occurred, claiming the lives of 15 people and a total of $10 million dollars in property damage. Seguin incurred similar damages, though no lives were lost.

Past research has indicated that community concern for flood problems is most effectively enhanced by floods (Kates, 1962). Certainly this proved the case in both Texas cities. There was pressure on the local city officials from private individual homeowners to pass the necessary regulations in order that the city could qualify for the

insurance program and citizens could continue to purchase flood insurance. The several city council members who were interviewed stated that the council did not strongly favor the restrictions, but they were forced by the federal provisions in the flood-insurance program to adopt them. One council member believed they would not have passed them on their own if the flood had not occurred and if the federal government had not required the land-use controls. The basic objection, he continued, was a philosophical one: if a person knows of the flood problem, he should be allowed to do what he wishes with his land.

Key Influentials Speak Out

Examination of newspaper articles and the minutes of public hearings identified the key persons in the adoption process. In addition, identification of the key influentials was sought through the Issue Specific Reputational Survey (ISRS). This survey determines the community's decision-making structure on a particular issue by identifying the individuals and groups most active. The ISRS is a variation of the reputational approach to the study of community power structures and has been used with increasing frequency in recent years (Clark, 1968). The standard panel of informants were interviewed; they were:

Mayor or Administrative Assistant
Member, City Council
Planner, Planning Department
Managing Editor, major newspaper
President, largest bank
Official, Chamber of Commerce
President, local Bar Association

In New Braunfels, nine significant individuals and organizations were identified by these informants as participating in the decision process; in Seguin, six were named (Table 1).

Next, a schedule of questions was administered to these identified individuals. By eliciting opinions of the people identified as most centrally involved in shaping local attitudes, policies, and actions affecting land use in the flood plain, the general interview schedule was designed to obtain information on their perceptions of the flood problem and evaluations of adjustments to the hazard, particularly the Federal Flood Insurance Program and required flood-plain regulations.

Since there were no significant differences in the supporting and opposing views between the two cities, their responses have been aggregated.

TABLE I

Identified Key Influentials

New Braunfels			Seguin		
Public Sector	Favored	Opposed	Public Sector	Favored	Opposed
Mayor-City Council	X		Mayor	X	
City Manager	X		City Council	X	
Planning Director	X		Building Official	X	
Soil Conservationist	X		Soil Conservationist	X	
Private Sector			Private Sector		
Newspaper Editor	X		Real Estate Subdivider		X
Professional Land Surveyor	X		Flood Plain Residents	X	
Flood Plain Residents	X				
Board of Realtors		X			
Insurance Agent		X			

Profiles of the Supporters and Opposers

Most support for the flood-plain regulatory program came from public officials and individual flood-plain residents (Table 1). Aside from city officials, there was no organized group, such as an environmental group, that presented statements at the public hearings. At both study sites, the main opposition came from real-estate and land developing groups.

All key influentials were upper white-collar workers, predominantly professionals and male (Table 2). The supporters were of similar educational background, though younger than the opposers. The income of the supporters was lower than that of opposers, a characteristic of the social class of the opposers and the generally lower incomes of city and federal employees.

In essence, these key influentials had a higher education, higher income, more prestigious occupations, and were older than the average for the community.

TABLE 2

Socio-economic Characteristics of Selected Groups

	Key Influentials vs. Community Averages	Supporters vs. Opposers
Education	higher	same
Income	higher	lower
Occupation	professional, more prestigious positions	same
Age	older	younger
Sex	all males	same
Tenure	N.A.	shorter

Information was obtained concerning the key influentials' evaluation of the regulatory program in terms of necessity, compatibility, advantages, and their assessment of the present program. To highlight some of the points brought out during the debate, the key influentials were asked if they recalled the range of arguments (not necessarily their own) used for and against the program.

Three measures of the relative importance of flood-plain regulations were employed: (1) the risk presented by floods in the area; (2) the factors involved in land development; and (3) the most important problems the city faced as perceived by the respondent.

Previous studies support the hypothesis that the perception of the hazard influences the decisions one makes. One's perception of the community's vulnerability to floods may then influence the conclusion as to whether flood adjustments are necessary or not.

Both groups perceived the flood risk as relatively high, for no one could deny the millions of dollars of flood damage that had been incurred a few years before (Table 3). Those who opposed ranked the flood-risk potential as slight to moderate, or 3.5 on a five-point scale. The supporters ranked the flood problem slightly higher--a mean score of 4.0 on the five-point scale. They differed more in their ideas on <u>how</u> the problem should be eliminated or reduced.

Each individual was asked to rank the relative importance of factors involved in land-development decisions in the area, e.g., geological, economic, sociological, flood risk, drainage, recreation, visual pollution, political implications, and protection of wildlife and natural vegetation. Among the opposers, 33 percent considered flood hazard as one of the three most important factors to consider

TABLE 3

Summary Table: Judgments of the Attributes of Flood-Plain Regulations

	Relative Importance		
	Flood-Risk Potential (five-point scale)	As an Important Land Development Consideration	Asian Important City Problem
Supporters	4.0	50%	41%
Opponents	3.5	33%	0%

	Compatibility	
	With Values (four-point scale)	
	Economic Development	Change
Supporters	2.4	3.2
Opponents	3.2	3.0

	Relative Advantage
	Compared to Other Flood-Control Measures
Supporters	50%
Opponents	0%

in the planning and execution of land development policies in their community, whereas 50 percent of the proponents estimated the flood hazard as one of the three most important factors in land development. What is surprising is that even after the flood experience of 1972 and 1973, and after the passage of flood-plain regulations, less than half of these community leaders considered flood hazards very important in land development. This lack of concern may result in a lenient enforcement of the existing flood-plain regulations.

The degree of salience that the flood hazard has in relation to other city problems was measured. Water-resource problems frequently are considered a low-order stress in the political environment, overshadowed by other more important problems (Kasperson, 1969). This appears to be true in New Braunfels and Seguin. In ranking city problems, both the opposers and supporters of flood-plain regulations listed an array of problems from urban slums to street repair and transportation concerns. Significantly, none of the opposers mentioned the flood hazard as one of the top three problems of the city. The degree of salience the issue had for the proponents was higher, with 41% citing flooding problems as one of the three more important community problems (Table 3).

Compatibility is defined in this study as the degree to which flood-plain regulations are perceived to be consistent with the existing values of the key influentials. It was hypothesized that conflict over land-use decisions between the opposers and supporters might stem from a difference in human values. Central to this part of the investigation was the proposition that the concept of values is one of the imperatives of action (Jacob, 1971).

Two values were thought to influence significantly the motivation behind the different positions the influentials took: concern for economic development and propensity for change. For the opposers, flood-plain regulations may have been seen as restricting the city's economic-development potential and may have run counter to some strongly held values on social change.

The value survey did not reveal a significant difference between the two groups, though some difference in the degree of intensity of these values was observed. The opposers emphasized a concern for economic development--on a 4-point scale they ranked it as 3.2 (Table 3). The supporters, on the other hand, had a considerably lower value for economic growth, indicated by a mean score of 2.4. Although it is not known where economic development ranks in relation to other values related to community affairs, this one measure does indicate the opposers' preference for economic development, perhaps irrespective of flood hazards.

Both groups appeared to value change. Commitment to innovation in social policy received a ranking of 3.0 for the opponents of flood-plain regulations and 3.2 for supporters (Table 3). Thus, both groups professed a desire for change and were disposed to seek new solutions for their community problems, though they differed on the means to accomplish change.

The answers to another query provided some information on how the individual ranked flood-plain regulations in relation to other types of adjustments. Both supporters and opposers favored engineering structures, such as small dams on the streams; however, while mentioning the desirability of these dams, supporters of flood-plain

regulations specified a combination of adjustments, placing land-use controls 50 percent of the time as first or second (Table 3). The opposers unanimously favored structural measures.

The evaluation of the advantage of flood-plain regulations relative to other types of adjustments undoubtedly is influenced by several factors: the evaluation of the degree of economic profitability, low initial cost, lower perceived risk, and perceived rewards (e.g., community eligibility for the Federal Insurance Program). Data were obtained concerning the respondents' recall of the range of arguments used in support of or opposition to the regulations. These arguments did not necessarily have to coincide with the respondents' views--but only with the arguments they recalled were raised.

Table 3.3.4 indicates the range of their responses. The opposers did not recall the argument that the regulations, by restricting future building, would reduce flood losses in property and lives. The only argument they recalled was the advantage of the federal-insurance availability. The opposers' perception of the economic consequences in the short run of flood-plain regulations may be so threatening that alternatives that reduce losses to the public in the longer run are not fully appreciated. Anticipated loss of speculative and inflationary gain from the land they own or control may convince the land developers and Board of Realtors that flood-plain regulations are entirely disadvantageous.

There seems to be a very low satisfaction with the current program of land-use control measures on the flood plain in both supporting and opposing sectors. Although both cities' ordinances do meet the minimum land-management criteria of the Federal Insurance Program, only

TABLE 4

Arguments for and Against Flood-plain Regulations

	Supporters (Mentioned by one or more)	Opposers
Arguments for:		
Federal Insurance availability	X	X
Easier to sell land when insurance is available		X
Reduce flood losses:		
Property	X	
Lives	X	
Federal relief not easily available	X	
Better upkeep of land	X	
Arguments against:		
No need	X	X
Too strict (lower to 25-50 year flood-plain)		X
Economic harship of landowners	X	
Slum areas occurring--impossible to reconstruct buildings, improve land	X	
No understanding of "flood-proof materials"	X	
Federal coercion--unreasonable requirements, penalties--no flexibility in program	X	X
Personal property rights offended--illegal	X	X
Negative effect on land values	X	X

50 percent of the supporters said they were satisfied with the regulations and 33 percent of the opposers voiced approval (Table 5). The opposers who were satisfied mentioned that the 100-year flood maps showed a smaller portion of land than they originally expected would be the case; they were willing to comply with controls over this smaller-than-expected area. Contrary to expectation, the supporters voiced dissatisfaction with the harshness of the regulations, rather than with their leniency. They felt the federal government had coerced them into adopting the regulations to qualify for the insurance program.

TABLE 5

Satisfaction With Land-Regualtion Program
(Percentage)

	Yes	No	Don't Know
Supporters	50	50	
Opposers	33		67

Drawing on their knowledge and experience with the program, supporters and opposers were asked what they felt needed to be improved. Most opposers thought that a 50-year flood plain was adequate for the regulation boundary and should be acceptable for community eligibility into the insurance program. Many mentioned that individual freedom was being restricted; a homeowner should have the option to waive the insurance and proceed to build or remodel as he wishes without affecting

community eligibility. Planning officials mentioned time lags in receiving the necessary flood maps and in communicating with HUD officials. Some suggested that a state agency should review applications and answer questions that might arise.

When assessing the flood protection provided by Canyon Dam to the city of New Braunfels, most supporters and opposers had little faith in the protection: 40 percent of the supporters thought the dam had little or no effect on reducing the flood hazard. A higher percentage (67%) of opposers responded similarly (Table 6). No one felt that the construction of Canyon Dam meant complete safety from flooding for the city. Such little faith in Canyon Dam is certainly expectable since the 1972 flood brought several million dollars of damage to the community.

TABLE 6

Perception of Canyon Dam Protection
(percentage)

	Eliminated Hazard	Reduced Hazard	Little or no Protection
Supporters	0	60	40
Opposers	0	33	67

An important element in the acceptance of innovations may be the knowledge that other places have successfully adopted the innovation. When the leaders were asked if other communities in the area were using flood-plain management techniques in order to reduce losses from

flooding, 50 percent of the supporters knew of cities or counties that had passed such regulations, while 33 percent of the opposers had knowledge of the acceptance of regulations by area communities (Table 7). The remainder of the opposers, 67 percent, did not know. Forty percent of the supporters thought that no other communities had adopted such regulations and 10 percent responded they did not know. It seems both groups had little knowledge of the acceptance of regulations in other nearby towns.

TABLE 7

Communication Link: Knowledge of Other Area Communities with Flood-Plain Regulations

	Other community with regulations	No communities with regulations	Don't Know
Supporters	50	40	10
Opposers	33	--	67

Decision Phase

The Council Meetings

In both cities, after initial acceptance, evaluation and formulation of an ordinance had been completed, the proposal was presented for public debate at open city-council meetings.

In order to make public input possible, most cities present revisions or additions to city ordinances at a series of public hearings. At both study sites, the general public was not concerned with this type of meetings unless directly affected; and of those directly

affected, few were present to raise questions and debate with planning officials. The "public" response represented a few interest groups, rather than a cross-section of local opinion.

According to the local newspaper, opposition to the proposed ordinance establishing land-use controls for flood-prone areas in New Braunfels was led by Kenneth Fiedler, a local real estate and insurance man (New Braunfels Herald, June 7, 1973). His main dissatisfaction centered on the provision which bars issuance of a building permit for new construction or extensive remodeling when the lowest floor, including basement, is below the 100-year flood level. "The whole thing boils down to a question of private enterprise," Fiedler said, summing up the main argument. "If an individual has an obligation to pay taxes on a piece of property, he has the right to do with that land what he wants." (New Braunfels Herald, June 7, 1973, p. 1). The ordinance would also create a taxing problem, he said, since landowners who were restricted from desired use of their land would be unwilling to pay high taxes on it and restricting building on the land would bar increased taxable values. It was mentioned that tax revenues from river properties would be reduced by 50 percent or more.

Letters from the New Braunfels Board of Realtors, which unanimously opposed the ordinance and the New Braunfels Insurance Exchange were read at the hearings (New Braunfels Herald, June 14, 1973). Several flood-plain landowners claimed the ordinance would devalue property to the point that river developments would become slum areas. The clause that restricted improvements to existing property could make an area permanently blighted, they claimed.

Other residents supported the ordinance mainly in order to keep the flood insurance available for the area. As one resident, Col. Walker Carrol, put it: "I depend on it--I sleep better for having it." (New Braunfels Herald, June 14, 1973, p. 10A).

While the debates continued, newspaper editorials in the New Braunfels Herald were written in support of the ordinance and the insurance program. The San Antonio newspapers also ran several articles describing the program and encouraging support for it.

Final Council Vote

Final approval of the flood-plain regulation proposal was given by the city councils of New Braunfels and Seguin. After the public hearings were held, the council reviewed the suggestions and made amendments. At both cities, only minor revisions were made to the original document.

In New Braunfels, on August 13, 1973, after three months of discussion, the city council passed the ordinance in full compliance with the Federal Insurance Administration regulations.

A minor amendment was made in the appeal-procedure section, which now routes such appeals through the Building Board of Adjustment and Appeals instead of the City Council. A second amendment provided that notice of denial of a building permit must be made in writing to the applicant by the building official, stating the reasons for the denial, and explaining the procedure for applying for a variance and/or appeal. A third recommendation for a change, deleting the penalty clause in the ordinance, was rejected by the council.

In Seguin, the city ordinance restricting development within the designated flood zone was approved on March 6, 1973, complying with standards set by the Flood Insurance Act of 1968. All new construction was to be elevated or flood-proofed to the 100-year flood level; the owner, seeking a building permit, was required to submit with his application a detailed plan for construction that complied with the standards of the ordinance and that had to be certified by a licensed engineer.

Problems Encountered in Implementation Phase

Legal Context: Constitutionality and Compensation

The ordinances became effective immediately after signature at the city-council meetings. Several problems arose before and after the implementation of the flood-plain regulations. One of these has to do with the basic legality of certain land-use controls. Although no major suits were filed in either city, different individuals and organizations affected by the regulations wanted to appraise their rights as property owners versus the role of local agencies to control their use of their lands. The president of the local bar association in New Braunfels felt the legality of the regulations could be questioned since they may interfere with property rights.

Where state enabling laws permit, the local governments have the right and responsibility to provide for the health, safety and general welfare of the community and may accomplish this by regulating land to its appropriate use (U.S. Water Resources Council, 1972). This exercise of police power, however, is subject to the conditions that it is reasonable, nondiscriminatory, and does not take private property

without just compensation. The reasonableness of particular regulations depends upon supportable data of the flood-hazard conditions. When the regulation proposal was first discussed, land owners questioned the accuracy of the flood boundaries and saw the possibility of using the "lack of sound data" as a basis for their case against the proposal to regulate developments on the 100-year flood plain. Estimates of potential flood boundaries compiled by the authorized federal agencies, such as the U.S. Soil Conservation Service or the U.S. Army Corps of Engineers, however, have had judicial support.

Review of court decisions regarding flood-plain regulations shows that courts are likely to favor the city's role in regulating developments, although in individual cases they may be sympathetic with landowners who are saddled with a substantial burden as a result of regulations (U.S. Water Resources Council, 1972). Court decisions are usually made on an individual basis. A court may consider a single regulation valid and constitutional as applied to one property and invalid as to another.

Regulations that require individual structures be elevated above certain flood heights increase the cost of the building to its owner; however, they reduce economic losses to the individual in the event of flooding. They also protect the safety of occupants, prevent the structures from floating onto other lands or channels, prevent blighting and unsanitary conditions resulting from flooding and minimize social disruption which occurs when structures cannot be used during or soon after flooding. In discussion of the regulations at both cities, concern was voiced about the public impact of the proposed restrictions and the need to balance public needs for safety and security against

private desires for freedom and privacy.

Compensation still remains a dilemma in both cities because of the youthfulness of the regulations. Municipal funds were not available to pay the owners of flood-plain land for the loss in speculative value to which they might claim to be entitled. Nor had methods been devised to evaluate and relate the amount of compensation to the losses suffered. In some cases, losses may be offset by benefits to the owner's adjoining land, reducing the necessity for compensation. The city officials at both cities voiced concern about the formulation and evaluation of a compensation program.

Adverse Effects on Land Values

Because neither city ordinance totally restricts development, buying and selling land for housing construction on flood plains has continued. A reason for hesitancy in adopting the ordinances had been the fear of depreciating land values in the restricted areas. Many persons are not interested in forfeiting, to a large degree, either the right to profit from holding, developing and using land or the right to derive non-monetary returns from its uses.

There is little evidence that the flood-plain regulations *per se* have adversely affected land values, according to city officials at both cities. It was the feeling, however, that the devastating floods of 1972 and 1973 did considerably lower the resale value of both homes and land along the flood plain for several months after their occurences. One land developer in New Braunfels thought that the values would soon be increasing again..."when floods are forgotten and the scenic qualities of the areas are desirable again." Concerning the land controls

in the area, many supporters thought that the controls would not greatly reduce the value of the land since some construction is permitted.

Whether or not the controls will lower the value of the land affected has been difficult for city officials to evaluate. If land values have decreased with the adoption of the odinances, this phenomenon may reflect a more accurate evaluation of the land when the flood-risk potential has been included.

Most opposition to the proposed regulations seemed to stem from lack of faith in the effectiveness of regulations and fear of the adverse consequences of them. The opposers' perception of the flood hazard was shown to be lower than that of the supporters. Whether this difference was because of their desire to play down the threat because of their vested interests or whether it was because they lacked understanding of the nature of the flood hazard is unknown. However, if their objections are based on misinformation and misunderstanding, then this fact may reflect failure in public communication. Public communication could be enhanced through public forums and information-dissemination programs.

The economic effects of a land-use regulatory program may not be adequately presented, or, perhaps more accurately, the planner may not have this type of information available. For example, recurring in the public hearings were questions regarding the consequences of regulatory measures of land use both to the community and to the individual property owners. Key community economic-impact questions pertained to the regulation's effect on the economic growth and tax base of the community. In answering, planners and city officials had very little detailed data

to rely on. Some economic models are available to asses economic benefits foregone by restricting the use of land (Brown, Contini, and McGuire, 1972; James, 1967); however, they are very narrow, not perfected, and difficult for the average planner to apply. In determining an optimal and satisfactory scheme for utilizing hazardous areas, little in the way of methodology and published experience of other communities is available.

Lack of Flexibility

The need for strict adherence to the land-management criteria of the Federal Flood Insurance Program was stressed by the city officials presenting the ordinance at the public meetings. Not meeting the requirements would jeopardize the city's eligibility for subsidized insurance rates, a city official noted.

The opposition, led by a local real estate and insurance man in New Braunfels, claimed there were provisions in the federal guidelines which permit less than full compliance with the restrictions, if sufficient data justifying such variance are supplied. Reference to Section 1910.5 of the Federal Register, 36F.R. 18175-86, was made during the public hearings.

This section states that a community which finds it necessary to adopt land-use and control measures which vary from the standards set forth in Section 1910.3 and Section 1910.4 shall, as a condition of acceptance, explain in writing the nature and extent of the variances and the reasons for their adoption, supported by economic, topographic, hydrologic and other technical data.

Some of those opposing the regulations thought a case could be made to lessen the restrictions on developments and future improvements on existing buildings by using the 50-year flood plain as the regulation boundary line instead of the 100-year designation. Charges were made that the city did not want to investigate the possibility of variances to the land-use and control requirements.

City officials at New Braunfels and Seguin made no attempt to apply for variances to the federal requirements. The detailed studies that were required to justify such variances were difficult, expensive and time-consuming for the city to complete, according to one supporter of the regulations. Satisfaction with the requirements by the city planning officials were given as another reason why no attempts were made to revise the regulations.

Time Lags

One important reason for delays in the passage of the ordinances at both study sites was the amount of time spent in corresponding with the HUD office in Washington, D.C., and in completing the necessary flood-hazard maps.

The planning official at New Braunfels noted problems in correspondence with the Federal Insurance Administrator's Office and that the information needs of the cities could best be served by a state agency which could review the applications and be available to answer unanticipated questions.

The amount of time required to prepare the flood-hazard maps delayed action of the regulation proposals. From December 4, 1970 until December 1, 1972, New Braunfels remained under the "emergency"

flood-insurance program. During this period, a flood-hazard study was conducted by the U.S. Soil Conservation Service, the results of the study being sent to the Federal Insurance Administration during July 1971. The city awaited receipt of the maps delineating the areas subject to the 100-year flood until December 4, 1972--eighteen months after the study completion. After study of the maps, the city passed the ordinance in compliance with the Federal Insurance Administration regulations in August 1973.

Similarly, in Seguin, city officials waited over two years for the completion of flood maps to assist in regulating the hazard areas. The city received a set of maps delimiting the 100-year flood area very roughly. The limits were squared off according to city streets and did not reflect the elevation level boundary. This made the enforcement of the ordinance difficult when the accuracy of the 100-year flood elevation was questioned.

City planners and engineers expressed concern over the expected time lags in up-dating the flood maps. Small retention dams are planned for the area, and new maps will be required to reflect the added protection the structures provide. Residents will want the reduced flood plain to be considered immediately after the dams are operative.

Annexation of new city lands along waterways will need to be studied and the availability of subsidized insurance to residents in areas where the flood maps are not complete is also questioned. These time lags have caused concern to the city officials and affected residents in both cities.

General Public Unconcern

Public awareness of the extent of the flood problem along with general support for the land-regulatory policy for the flood plain may be essential if flood-plain regulations are to be accepted and effective. If the community is convinced of the need and effectiveness of the regulations and participates in their formulation, voluntary compliance may be promoted. It has been observed in other studies that member satisfaction with (Morse and Reimer, 1956; French, 1958; Seashore and Bowers, 1963), and acceptance of (Rogers and Shoemaker, 1971; Davis, 1963; Queeley and Street, 1965) collective innovation decisions is positively related to the degree of participation by members of the social system in the decision.

As may often be the case, however, only a small segment of the community was concerned enough to participate in the public hearings. Also, of those attending, many were opposed to any type of regulation; some opposition may have come from inaccurate evaluation of information. If the members of the community do not favor a non-structural program for flood control, there may be difficulty in implementing and enforcing such a program.

It may be advisable, then, that widespread dissemination of information on the flood problem and the proposed regulatory program start before and while the plan is being formulated and debated, and continue after the program is adopted. Some areas within the flood plain may continue to be attractive for human occupancy and future commercial and industrial expansion if the risk of flood is not clearly understood and recognized and proper land-use patterns employed. It is often possible to direct developments to available land not subject to flood hazards.

Contending with Opposing Forces

These case studies indicated that few groups actually participated in the public hearings, and of those the most organized were the realtor, the subdivider and other business interests. Because of their financial resources they were a potent force opposing a land-regulatory policy that might be in the best interests of the community.

The business and commercial sector, however, may have valid arguments and can provide the necessary stimulus in formulating a plan that can help reduce potential damage from floods and yet allow the community to develop in the direction it desires. These landowners and developers are an important unit in the community and will be directly affected by what is resolved; their participation in the planning and decision process is valuable.

However, the business interests who were most vocal may not represent the totality of public opinion. When planners consult some of the interested parties but not all those affected, they may not be responsive to general public goals. Efforts to solicit the opinions of other sectors and individuals may be profitable. There is a strong argument here for the need to assess what other forms of intracommunity discussion and agreement could be used to involve more of the affected parties, and what effects these new methods may have on the subsequent management policy and its enforcement.

Some Comparative Notes

The Structure of Influence

An earlier study of two midwestern communities of similar size was undertaken (Simdowski, 1973) to investigate the process and problems

involved in adopting regulations for flood-hazard areas. Comparison with the study of these two Texas cities reveals several similarities and differences in composition of the influential sector, leader characteristics, and the overall adoption process.

There appears to be no regional difference in the number of groups or individuals participating in the decision process of adopting flood-plain regulations--public apathy prevails except for a small number of concerned flood-plain residents, businessmen and public officials. In both regions, the main supporters were public officials. More flood-plain residents in the two Texas communities, however, attended the open meetings in favor of the regulations as compared to the midwest cities, probably in order to secure subsidized flood insurance for their properties since they had recently suffered extensive flood losses. Citizen support in the midwestern cities seemed to stem from a desire to initiate more flood-plain parks and open-space areas. Flood insurance was not the primary motive of their support, perhaps because no extensive flood damage had been recently incurred.

In both regions, main opposing forces drew their ranks from the real-estate and business sectors. Considerably more flood-prone land was in developed commercial sectors of one midwestern city, and thus drew extensive opposition to restricted development and improvement from this sector. No commercial interests organized in opposition at the two Texas cities.

Characteristics of the Decision-Makers

The involved community leaders came mainly from a relatively small prestigious group of business-commercial interests, flood-plain resi-

dents, and public officials in both regions. Little difference in socio-economic characteristics was detected.

When evaluating the flood-risk potential, the proponents in both regions gave similar responses. The opponents in the Texas cities, however, ranked the flood risk as 3.5 on a five-point scale, higher than those respondents in the two midwestern communities (2.0). Again, it may be that the recent flood damage in the Texas communities influenced their evaluation. Similar concern for flooding as an important land-development consideration and as an important city problem was observed. Agreement in value orientations was also discovered--supporters were lower in their concern for economic development than the opposers, but all, regardless of their position in respect of the regulations, were high in their concern for change.

A divergence in the evaluation of the advantage of flood-plain regulations relative to other flood-damage mitigation techniques was detected between the two regions. In the midwest, 76 percent of the supporters saw regulations as the primary source of control, while 50 percent of the supporters in Texas answered similarly. Forty-five percent of the opposers in the Illinois and Indiana cities mentioned the relative advantage of the regulations, though none of the opposers in the Texas areas agreed with that position. Residents in the Texas communities most often favored structural measures to prevent future flood damage. This desire to have protection from engineering structures may be influenced by Canyon Dam. A series of small dams is nearly completed or in the final stage of design above both Texas cities--perhaps influencing the leaders' faith in engineering structures. In the Illinois and Indiana communities, the Corps of Engineers

study could not economically justify flood-retention dams, perhaps influencing the leaders to turn to other, non-structural, means of flood-loss reduction.

The Adoption Process

A similar mode of initiation, evaluation and implementation of the flood-plain regulations occurred at the two midwest study sites. Similar problems in evaluating the effectiveness and economic consequences of the regulations were expressed. A noticeable difference was seen in the length of discussion time. At the midwestern cities, the time of first presentation of the proposed ordinance to actual passage had been over two years; the Texas communities passed the ordinance within less than eighteen months. Although the time lags in securing the flood maps were a large factor in each of these cities, six months after receipt of the maps the two Texas city councils had taken action to incorporate the regulations into their city ordinances. Again, recent and serious flood damage encouraged area residents to pressure the city council into passing the necessary regulations to obtain subsidized insurance. After the floods of 1972, action to enter the Federal Program on the "regular" basis was swift. Opposition at the midwestern cities seemed to have a stronger hold over the decision process, delaying action on the ordinance and eventually altering the severity of final regulations.

Findings and Their Application

Community Response

Flood-plain regulation proposals seem to encounter general public apathy, although they may produce conflict within the local power structure. This gives an indication of why in many cases adoption has been slow although potential effectiveness may be great.

The structure of decision-making affecting the regulations lies mainly in a relatively small prestigious group of business-realtor interests, flood-plain residents and public officials. Most organized participation from the private sector is in the opposition; seldom do supporters organize to secure passage of the regulations. In both cities, the main overt supporters were the public officials and several flood-plain residents who suffered extensive damage in the latest floods.

The recent flood damage seemed to have a strong influence on the outcome in Texas. Passage of the ordinance went quickly after the occurrence of the 1972 and 1973 flooding. Although at first there was strong pressure by the business and realtor interest to adopt more lenient regulations, the final ordinances were in accordance with the federal requirements to secure flood insurance.

There was considerable variation among respondent's perception of risk of the flood and their evaluation of the consequences of the flood-plain regulations. It may be that flood data are misinterpreted, in which case better information-dissemination methods would yield beneficial results.

Problem Areas in the Current Process

Delineation of the flood zones created some problems in both communities. Both relied on the Soil Conservation Service to examine the extent of the hazard, and the time lag from requisition to completion and up-dating the information was of particular concern. Rough interim maps with flood boundaries squared off by city street makes exact 100-year flooding areas questionable and poses enforcement problems.

Public officials in the local planning or zoning commission are mainly charged with formulating a flood-plain policy and selling it to the public during the public hearing stage. In formulating the policy, city officials lack a well-defined methodology to determine a satisfactory scheme and appraise the social and economic consequences it will have within the community.

In defending their proposals before public review, city officials may have little in the way of detailed studies and data to convince those at the hearings that flood-plain regulations are an effective means of mitigating the flood hazard, while yet not interfering with the economic health and growth of the community. The landowners and developers fear damaging repercussions--specifically, on their personal freedom and economic situation (the resale of their property and loan availability) and generally, on the tax base and growth potential of their community. Some officials may not be able to refute convincingly these opinions. If the public understanding of economic and social costs and benefits remains unclear, there may be increased difficulty in passage of the regulations and later in the effective enforcement of them. It should also be acknowledged that

identification and publication of any prospective adverse economic or social effects of flood-plain regulations may further reinforce opposition. Awareness of the tradeoffs related to each of the regulations early in the discussion, however, may help in the formation of a more satisfactory set of controls.

The perceived lack of flexibility in the federal requirements for land-use regulation may have greatly influenced the low level of satisfaction with the implemented ordinance (only 50 percent satisfaction among the supporters). Although the federal law provides that communities may adopt land-use and control measures that vary from the standards, cities may have a difficult time in securing the necessary data to justify the variance. Further contact between the Federal Insurance Administration officials and individual communities would clarify these and other subsequent problems.

Implications for Public Policy and Research

Three levels of responsibility and participation--federal, local and citizen--have been identified and their roles evaluated. Recommendations for potential improvements can be suggested.

The federal program for flood-insurance assistance has provided impetus to local communities to advantageously use their flood plains. The flood-insurance program encourages land-use regulations that direct further structural development away from hazardous lands and provides insurance protection for buildings already located there. Difficulties and time lags in corresponding with federal agencies were experienced; better and more efficient communication links with individual communities would certainly reduce the problems.

At the local level, initiating and maintaining awareness of the flood situation may be essential to formulate acceptance of the regulatory program. To promote voluntary compliance with flood-plain regulations, those most affected by the flood hazard must be convinced of the exigency and effectiveness of those regulations. An educational program by way of dissemination of flood-hazard maps and descriptive explanation of the city's susceptibility to hazard and of proposed plans seems essential.

In order to achieve satisfaction with and acceptance of flood-plain land-use control programs in those communities that have not experienced a recent flood, it may be advisable to expand public participation. Since the federal program of flood insurance provides some flexibility, local citizens should be involved in task forces which evaluate the situation, disclose alternative, integrate different goals and plans, and help develop policies which are later discussed at general public hearings. These public committee meetings would enable approach of the problem from different viewpoints. A compromise achieved by this means may result in a plan more responsive to the interests of broader segments of the community.

Greater involvemnet with greater numbers of citizens who will be ultimately affected by such regulations would balance the effects of the often powerful business and commercial interests.

To make participation more profitable, citizens should be informed about the effectiveness and weaknesses of different flood-plain regulations. Citizens need to know what experience has shown about these regulations and what the social and economic consequences have been,

both to individual owners and the community. There is currently a paucity of information on these points and further research is vital.

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THE PROBLEMS AND ISSUES OF IMPLEMENTING THE NATIONAL FLOOD INSURANCE ACT IN OREGON

Rod Emmer

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Introduction

Streams and rivers in Oregon have always flooded, but it is only recently that this has become consequential. With the first permanent European settlers in Oregon and their associated agricultural, commercial, and residential areas, inundation took on new dimensions, as losses to the individual and the state economy rose. Oregon losses have continued to increase in spite of the $450 million spent in the last 30 years by the Corps of Engineers on flood control structures and untabulated millions spent by other federal and local governments. In 1968, a national flood insurance plan was enacted by Congress as another federal disaster assistance program. The National Flood Insurance Act of 1968 (NFIA) was considerably different from other disaster relief policies; it required land use regulations in flood-prone areas. This was the first assistance bill of Congress that included prerequisites designed to prevent and reduce flood losses by any means other than engineering techniques.

This study's purposes are to assess the issues and problems of implementing the NFIA in Oregon. The research seeks to determine the impact of land-use regulations as required by Congress and the attitudes of flood-plain occupants towards the insurance.

The study was limited to the twenty-one areas in Oregon eligible for flood insurance as of June 29, 1972 (Table 1). This date was selected because in depth research of the individual cities and counties was started in July 1972. Review of state planning and zoning legislation also was limited to those acts in effect as of this date. These

TABLE I

Unincorporated and incorporated areas in Oregon eligible for flood insurance as of June 29, 1972

Unincorporated Areas	Incorporated Areas
Clackamas County	Gladstone
Curry County	John Day
Douglas County	Milwaukie
Grant County	Myrtle Creek
Jackson County (R)	Pendleton
Josephine County (R)	Portland
Land County (R)	Roseburg
Marion County	Salem
Multnomah County	Springfield (R)
Polk County	Winston
Umatilla County	

R designates areas on the Regular Insurance Program.

Source: State Farm Fire and Casualty Insurance, Northwest Office, Salem, Oregon.

were the laws by which the study areas initiated flood plain management programs. The survey of the attitudes of flood plain occupants towards flood insurance was restricted to Lane County because in July 1972, Federal Insurance Administration maps showing the 100-year flood plain were available for only Lane County and the City of Springfield. The flood-prone areas of Springfield were unoccupied agricultural lands and thus were eliminated from the survey. The survey concentrated on a subdivision north of Eugene.

Flood-Plain Use

Since the early civilizations along the Nile and Tigres-Euphrates, people have clustered on the alluvial areas associated with rivers. Likewise, in the United States, the use of flood-prone areas has always been important. Flood plain use progressed from scattered, semi-permanent American Indian villages and fields to the sparsely populated, colonial agrarian society. With the continued economic development and population growth of the nineteenth and twentieth centuries, urban and industrial uses of rivers and flood-plains for waste disposal, transportation, water supply, irrigation, agriculture, and construction increased. With the greater demand on river and the more desirable lands, flood damages have continued to rise (H. Doc. 465, 1966). Of course, the damage caused by flooding along a particular reach of river is directly related to the type of development along that stretch of flood-plain. Communities focus development in a limited area, resulting in high property losses when small areas are inundated. Open space uses, on the other hand, are "relatively harmonious with the characteristics of these riverine areas" (Muckleston, 1973, p. 2).

Oregon is no exception to the general rule of increased flood plain development. According to a knowledgable observer* (Ingram, 1964, pp. 83-84), marked encroachment on the Willamette River flood plain began in the 1930's when "people started clearing lands and building homes and other structures in the flood plain in an attempt to wrest it away from the rivers in defiance of nature." The most common form of flood plain encroachment was subdivision development, which increased during and after World War II. It is primarily this use which concentrates people and property in a limited space, so when there is a flood, damages are multiplied and monetary losses rise. The most recent example is the 1964-1965 floods which inundated subdivisions near Salem and industries near Portland (Emmer, 1974).

Table 2 summarizes the flooding characteristics and flood damages for the study areas.

Methods of Reducing Flood Losses

There are three basic approaches to reducing flood losses: corrective measures, preventive measures, and a combination of the two. Corrective measures, which attempt to keep the water away from man by controlling the spatial and temporal distribution of water, include dams, reservoirs, levees, walls, channel improvements, or watershed treatment, as well as evacuation, flood forecasting, flood-proofing, and urban development (TVA, 1962). The Corps of Engineers and the Soil Conservation Service are the primary national flood protection

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TABLE 2

Summary of flooding characteristics and flood damages for the study areas

Basin (Study Area)	Physiographic Regions	Precipitation Maximum Minimum	Flood Period	Flooding	Most Destructive Storm*	Damages* Dollars	Type of Flood Plain Occupance
Willamette Basin (Clackamas Co;Lane Co. Marion Co; Multnomah Co; Polk Co; Gladstone; Milwaukie; Portland Salem; Springfield)	Willamette Valley; Cascade Range Coast Range	late fall and winter Summer	late fall to early spring	rapid rise in temperature; melting snow on frozen ground plus continuous heavy rains	December 1964-January 1965	70,749,000	Mostly rural, but with extensive urban and suburban areas
Mid-Coast Basin (Polk Co;Lane Co)	Coast Range	late fall and winter Summer	late fall and winter	rapid run-off of rains and along coast-tides	December 1964	approximately 346,000 for study area	urban along coast
Umpqua Basin (Douglas Co;Myrtle Creek; Roseburg; Winston)	Klamath Mt. Cascade Range Coast Range	late fall and winter Summer	late fall to early spring	combination of snowmelt and rain	December 1964	25,964,000	urban along coast and around Roseburg
Rogue River Basin (Jackson Co; Josephine Co; Curry Co)	Klamath Mt. Cascade Range	Winter Summer	Winter	rains more important in main channel	December 1964	16,382,000	urban along coast and in central Valley
South Coast Basin (Curry Co)	Klamath Mt. Coast Range	late fall and winter Summer	late fall and winter	rapid run-off of rains and along coast-tides	December 1964	unknown; but small for study area	urban along coast

agencies through their flood control and flood abatement projects. Local levels of government and private citizens are responsible for flood-proofing, evacuations, and other corrective measures in times of emergency.

Corrective means can reduce flood losses; however, the effectiveness of these methods is limited to specific reaches of waterways and only to a certain flood stage. People gain a false sense of security from structures and may develop additional lands that are even more flood-prone (U.S. Congress, House, 1966, p. 8). The basic disadvantage of the corrective approach is that it treats the problem of flooding rather than the cause of flood losses: constantly expanding flood plain development.

Preventive measures, on the other hand, keep man away from the water by directing and controlling flood plain occupancy. Preventive measures are normally considered to be flood-plain regulation through zoning ordinances and subdivision regulations, and other measures, such as development policies, preservation or acquisition of open spaces, tax adjustment, and warning signs (TVA, 1962). The conscious manipulation of settlement patterns by governmental agencies to reduce flood losses is a relatively new concept (Solberg, 1971, p. 33). White (1942), Murphy (1958), and the Water Resources Council (1972) have traced the use of preventive measures in the United States. Widespread interest in flood-plain zoning did not come until the 1950's. Preventive measures have one notable disadvantage: they do not completely recognize that the people already living on flood-prone lands may be entitled to some structural and monetary forms of protection.

The third approach to reducing flood losses is a combination of the corrective and preventive measures. This approach recognizes that people who already live in flood-prone areas must be protected both physically and monetarily. Furthermore, it recognizes that in order to reduce potential flood losses, additional flood-prone areas must not be developed for uses susceptible to extensive flood damage. At present, the principal technique of integrating corrective and preventive measures into a single comprehensive program is flood insurance. The flood insurance program is designed to reduce increased flood losses through a system of social constraints on land use. The prerequisites for participation in the program can include maintaining a designated floodway, flood-proofing of structures, enacting and enforcing zoning ordinances, subdivision and building codes, and health regulations. Control is directly related to the intensity and frequency of flooding. As a result, areas subject to inundation are under severe restrictions, whereas areas less likely to be flooded are subject to fewer restraints.

The National Flood Insurance Act of 1968, As Amended

Congressional interest in furnishing disaster insurance has been sporadic, waxing immediately after a major flood and then waning with the passage of time (Dacy and Kunreuther, 1969). The first legislation was proposed in 1951 after the devastating Midwest floods of that year. In a special message to Congress, President Truman requested a federal flood-relief plan that included funds for flood insurance. However, after extensive hearings, no positive action was taken on the proposed flood insurance and interest declined. In 1965, unusually destructive

floods renewed federal interest. After lengthy study, the 84th Congress authorized the Federal Flood Insurance Act of 1956 (PL 84-1016). Again Congress failed to pursue the matter, because no acceptable basis for actuarial rates was established (U.S. Congress, Senate, 1972). For eleven years the Act lay dormant for lack of funds (Bernstein, 1971).

After Hurricane Betsy inundated about one-third of New Orleans in September 1965, Congress authorized the Department of Housing and Urban Development to investigate the feasibility of flood insurance. Based on available data, the Department recommended the adoption of an insurance plan. Acting on these positive conclusions and on later committee hearings, Congress passed the National Flood Insurance Act of 1968. Section 1303 of the Act repeals all of the Federal Flood Insurance Act of 1956 except the authority to borrow from the Treasury. The Federal Insurance Administration in the Department of Housing and Urban Development directs implementation of the Act.

The legislative history of the NFIA is reviewed elsewhere (Emmer, 1974). The objective of the Act and amendments and the prerequisites for local participation in the program are summarized here. The NFIA is designed to relieve flood losses in two ways. First, the Act helps "victims of flood damage to restore their homes and business;" and second, the Act minimizes "the future risk of flood losses in locations and situations where the risk of flood loss exceeds the prospect of gain from use of the site" (U.S. Congress, House, 1967, p. 10). Funds are made available promptly for restoration of the property up to the amount insured. The Act discourages imprudent use of flood-plains by requiring local jurisdictions to adopt effective land use controls as a prerequisite to participation in the flood insurance program. As

noted by the Federal Insurance Administration (n.d.):

> ...the requirement to adopt land-use and control measures is of the essence of the program. Without it, there would be no incentive to reduce losses, and the program would encourage rather than discourage imprudent use of the nation's flood plains.

In order to become eligible for insurance, a political jurisdiction must comply with a set of minimum standards as published in the Federal Register. The standards for land-use regulations can be classified into four groups: zoning laws, subdivision regulations, building codes, and miscellaneous ordinances. The special flood hazard area (the 100-year flood plain) is zoned into a floodway and a floodway fringe. The standards stipulate that the laws, ordinances and codes enacted to reduce flood losses through land-use and control measures take precedence over all conflicting statutes. The result is that nonconforming uses which exist at the effective date of controls can continue, but cannot be expanded into the floodway. However, existing developments may be flood-proofed as long as the modifications and repairs do not increase the regional flood level. Floodway fill is also prohibited except where channel alterations offset any increase of flood heights. Land-use, in the floodway and floodway fringe, is also subject to the other standards of the Administrator.

Under the Act's requirements, subdivision regulations must require proposed developments to incorporate practices that minimize flood damage. Sewer, gas, electrical, and water systems must be constructed, raised, or placed at such locations as to eliminate, or minimize, flood damage. Drainage must be designed and built to reduce exposure time of properties to flooding.

Building permits are mandatory for all proposed developments or improvements in the flood hazard area. On major repairs, flood resistant materials and utilities are to be used in combination with construction methods and practices which minimize flood damage. Structures are to be protected against floods and designed, or modified, so that they can be anchored. Anchoring prevents the flotation, collapse, or lateral movement of structures. This prevents them from becoming hazardous to the health and safety of flood plain residents. New and replacement water and sewage systems must be built to minimize, or prevent, flood water from entering or discharging from them. This applies to on-site waste disposal systems as well. The final building standard requires all new or substantially improved structures to have their lowest floor elevation (including basement) above the 100-year flood level. In the case of non-residential structures, this requirement is modified. That is, the building, its utility, and sanitary facilities may be flood-proofed below the 100-year flood level.

Only one of the Federal Insurance Administration's printed standards can be placed in the miscellaneous category. Communities must assume a more regional view of the flood problem. They must take into account flood plain programs in neighboring areas. For example, without this stipulation, one area could develop flood plains while meeting the minimum standards for insurance. Development, however, could cause increased water heights and damage in adjacent jurisdictions even though no such problem occurs in the restricted zone.

More restrictive laws, ordinances, and codes may be applied at the local level. Some communities may wish to list permitted and/or

conditional uses for the floodway fringe. For example, only open space uses may be permitted in the floodway. Subdivision regulations can require streets to be at a designated height relative to a regional flood in order to facilitate access to and from developments at time of inundation. Warning signs can be posted along the boundaries of the floodway and floodway fringe declaring the hazardous status of the area. Flood potential for each piece of property can be clearly stated and explained on titles to all plots in the special flood hazard area. Which extra limitations, if any are to apply depends on the judgement of the local decision-maker.

Background for Flood-Plain Management in the Study Area

Until recently, no flood plains in Oregon were subject to special regulation. For the initiation of a flood plain regulation program a sequence of events must occur. First, county and city governments must have the authority to control land use within their jurisdiction; next, planners and decision-makers must perceive that flood plains differ from other lands because of periodic inundation and, therefore, must receive special attention. Finally, county and city councils must recognize that flood plain management is an acceptable complement to the engineering techniques in reducing flood losses. This series of conditions did not occur until the mid-1960's when federal and state policies stimulated and permitted enactment of flood plain regulations in Oregon.

The Power to Zone

By the early 1960's each of the counties and cities in the study had the power to control land use in its jurisdiction through zoning laws, subdivision regulations, building codes, and miscellaneous ordinances, and, in most instances, they had adopted some form of regulation (Table 3). City and county governments are granted the powers to plan and regulate for the conservation of natural resources and the protection of the public health, welfare, and safety.

Oregon cities acquire their powers to regulate development by the Home Rule provisions of the Oregon Constitution, by powers implied in city charters, by authority granted cities which lack charters, and/or by the explicit powers authorized by the state law*. The first three means of acquiring planning and zoning powers are implied through such phrasing as "to regulate their own affairs" or "take all action necessary or convenient for the government of its local affairs" (ORS 221.410). In 1919, the legislature passed explicit measure permitting cities to control land development in their boundaries (ORS 227). They may also control development in areas within six miles of their corporate limits (ORS 92).

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*For a more thorough discussion of planning and zoning in Oregon see Planning by Local Government in Oregon, Bureau of Municipal Research and Service, University of Oregon, 1963, which this section summarizes. For a recent analysis of this topic see: Oregon Land Use Legislation, Vol. I, Analysis and Vol. II, Enacted Bills prepared by the Local Government Relations Division and the Oregon State University Extension Service (1973).

Table 6. Dates of initial zoning, subdivision regulation, and building codes in the study areas.

County unincorporated areas	Date of Zoning Ordinance	Date of Subdivision Regulation	Date of Building Code
Clackamas	1957	1955	1957
Curry	*	*	*
Douglas	1960	1955	1958
Grant	1949	*	*
Jackson	*	1959	*
Josephine	1961	1958	*
Lane	1949	1949	*
Marion	1960	1962	*
Multnomah	1955	1955	1955
Polk	1961	1960	*
Umatilla	1961	*	*
Cities			
Gladstone	1954	1956	1954
John Day	*	*	*
Milwaukie	1946	1960	1945
Myrtle Creek	1955	*	1950
Pendleton	1954	1955	1938
Portland	1924	*	1891
Roseburg	1955	*	1949
Salem	1926	1958	1939
Springfield	1939	1959	1940
Winston	1960	1960	1960

*Date unknown

Source: Bureau of Municipal Research and Service, 1963

From: Emmer, Rod E. 1974. The Problems and Issues of Implementing the National Flood Insurance Act in Oregon. Ph.D. Thesis, Oregon State University, Corvallis, Oregon.

Acquisition of zoning powers by counties has been more recent than that of cities. Counties were limited to those powers granted by state statutes until 1958 when they were allowed to seek Home Rule charters. The 1947 Legislature enacted laws authorizing counties, but not requiring them, to plan and zone for unincorporated areas of the county (ORS 215). Expanded county planning powers were enacted in 1963 (ORS 619).

Recognition of Flood Plains as Unique

Evidence suggests that flood plains were first regarded as special categories of land use in Oregon in 1962, when the Metropolitan Planning Commission of Portland devised its own land use system. The original manuscript, published in 1962 as Methods and Classifications for Land Use Inventory, employs a three-digit numerical code to classify land uses. Code 101 designates "Rivers, sloughs, etc., including adjacent land subject to flooding." The code was revised and expanded in 1966 by the Bureau of Municipal Research and Service* and has become known as the "Oregon Standard Land Use Code (OSLUC). Flood-prone areas are now coded 108, "Designated flood plains, flood basins (areas usually out of water but set aside for escape or retention of flood waters)."

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*The reports of this Bureau are not "automatically sent to all county and city planning commissions." Depending upon the subject matter, each is sent to appropriate agencies.

The "Oregon Standard Land Use Code" was made available to city and county planning agencies in the state primarily through the several field offices of the Bureau which were in existence in 1966.

Several meetings with various planning groups were held both before

Flood Plain Regulation

Although initiation of flood plain regulation programs by some planners and decision-makers occurred before the National Flood Insurance Act was passed, they did not necessarily employ this tool in guiding flood plain development. Whie, in the mid-1930's was one of the first to recognize that engineering techniques could not completely solve the flood problem. Numerous studies have since been published by Whie and his associates explaining approaches to flood damage reduction. In 1960, Congress forewarned of the hazard of increasing utilization of flood plains when it enacted Section 206 of PL 86-645. The Section authorized the Corps of Engineers to furnish, upon request of local officials, Flood Plain Information Studies. These studies were to provide "information on flood hazards, to serve as a guide to such development, as basis for avoiding future flood hazards by regulation of use by States and municipalities..." (PL 86-645, Section 206).

In 1961, the Oregon State Water Resources Board requested the Corps of Engineers to furnish a Flood Plain Information Study for Land County. The study compiled specific information on floods, potential floods, and areas subject to inundation by floods of a 20 and 100-year frequency. The Summary Report (November 1964) specifically recognizes flood plain management as an important tool in reducing flood losses. The report states in the Preface:

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and after the development and refinement of the "Oregon Standard Land Use Code" to obtain and disseminate information and suggestions. I have no record of the dates of such meetings (Keith, 1974).

A locally instituted and enforced program of Flood Plain Management would be a valuable supplement to existing and future flood control works. It would tend to reduce the cost of future floods by placing a degree of responsibility for damage prevention on the users of the flood plain.

Flood Plain Regulation in Oregon

Only Lane County, Washington, Roseburg, and Prineville are known to have instituted any form of flood plain regulation in Oregon before the NFIA took effect. Both Lane and Washington Counties enacted their ordinances in 1965 as a result of the 1964-1965 floods. After these first two jurisdictions enacted flood plain management programs, three years passed before Roseburg and Prineville enacted their ordinances in 1968.

Tables 4 and 5 compare the final standards of the Federal Insurance Administration with the county and city flood plain ordinances in effect in April 1973.

A Survey of Flood Plain Occupants

The National Flood Insurance Act of 1968 is designed to relieve flood loss in two ways. First, it minimizes "the future risk of flood losses in locations and situations where the risk of flood loss exceeds the prospect of gain from use of the site," and second, it assists "victims of flood damage to restore their homes and business." (U.S. Congress, House. 1967.p.10). This section discusses the latter objective which can only be achieved if the occupants know their homes can be flooded, if they are aware that subsidized insurance is available in the community, if they are willing to purchase it, and if they

TABLE 4

ood plain ordinances in effect April, 1973 --

red to the final standards of the FIA

	Building Codes						Miscellaneous	
7	8	9	10	11	12	13	14	Comments
29.11A2 29.14D4	29.11A3g 29.14D1 29.14Dg	29.11A2 29.11A3k 29.13E2c 29.13E3a	29.11A2 29.11A3k 29.13A2c 29.13E3a	29.12 29.14	29.11A3c, d j, c, k 29.13E3a 29.14E5b	29.11A3b, c, f 29.14D4, 5b, c, f, h, c, j	29.14C9	No structures, fill or storage of materials or equipment is allowed
								No ordinance yet
	16.F4c 16.F4d	16.F2	16.F3	16.D2 16.D2 16.D2				G. Permits issued must not be detrimental to the intent of the flood plain ordinance
3.053		3.054	3.054	3.054				
380.6	3.80.3	3.80.1	3.80.2	3.78	3.80.5			3.76 Permitted Flood Plain Uses; 3.77 Conditional Flood Plain uses
								Section 8 Uses Permitted
	3C	3B	3B	2				Each permit subject to special requirements as necessary (Section 4)
2a	178.040.2.7			178.040.2e4			178.060	Subdivisions prohibited
		178.040	178.040			178.040.2	178.060	

Building Codes					Miscellaneous		
8	9	10	11	12	13	14	Comments
410Fc 410Fd	4.410F2	4.410F2			4.410E1e 4.410F3		No structures or storage of dangerous materials. Any development plans must be submitted to the City Engineer or Building Dept. for approval so that they do not violate the intent of the flood plain ordinance (4.410B).

13 Construction methods and practices that minimize flood damage - 1910.3b5ii

14 Take into account neighboring flood management programs - 1910.3b1

on more than 1 ft. - 1910.3d5

luding basement - 1910.3d3

TABLE 5

plain ordinances in effect, April 1973

to the final standards of the FIA

	Building Codes					Miscellaneous	
	9	10	11	12	13	14	Comments
	3.8401	3.8401	3.8401				
					3.1503a.1.b.1		Perhaps the wording 3.1503a2b2e applies to the height requirements
a				3.150.2b, .2e .4	3.1503a.1.b.1		
					3.1503a.2.b, .2.3.,2, .3, .5		
;a.2.b			3.1503a.2			3.150.3a2b1i	
							Would not furnish copy of the ordinance
	10a, 12A	10A, 12A	12	10B, 12A	10B		Does allow for variances Section 18-21
	1.3		1.1	1.1b	1.1c		Ordinance too general
.3	3.606.2	3.606.2	3.606	3.606.1	3.606.1		
							No ordinance yet
							6 permitted uses, one general statement about preventing flood damages (Section 3.03b)

Building Codes					Miscellaneous	
9	10	11	12	13	14	Comments
6.5512	6.5512		6.5513.4	6.5513.2.3, .6, .8, .9, .10		No structures, fill, or storage allowed
6.5624	6.5755k	6.562	6.5775			
3.1561	3.1561	3.158	3.1582	3.1562 3.1564 3.1582		

nstruction methods and practices that minimize flood damage - 1910.3b5ii

ke into account neighboring flood management programs - 1910.3b1

than 1 ft. - 1910.3d5

basement - 1910.3d3

receive sufficient information on hazardous conditions from authorities. To determine the attitudes of potential insured persons, a survey was mailed to a sample of flood plain occupants in a study area.

The Sample

Lane County was chosen for the study because it was one of the study areas in late 1972 for which FIA approved maps* showing the one-hundred year flood plain were available.** The sample was selected from four sections*** and based on three qualifications.

First, the structure must have been build in a subdivision type tract within the limits of the 100-year flood plain as defined by the FIA. Tract homes are commonly built on slabs and are, therefore, more susceptible to flooding than rural homes. The latter are usually on some form of raised foundation. In addition, homes constructed on rural agricultural flood plains are usually built on land above most floods. Second, homes had to be constructed before the spring of 1965 because homes build after this date had to comply with the Lane County Special Permit requirement. That is, they had to have the lowest floor above flood waters. A photo mosaic, in the Lane County Planning Office and dated March 8, 1965, was used to locate structures built prior to this date. Only structures identified as being part of a subdivision were selected.

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*FIA Flood Hazard Boundary Maps No. I-41-039-0000-06 through No. I-41-039-0000-22, effective December 29, 1971.

**The other study area for which FIA approved maps which defined the 100-year flood plain were available at this date was Springfield. Springfield was eliminated for the survey because the flood-prone areas

The third qualification limited the survey to houses which the county assessor's roll showed were occupied by persons who paid the 1972 property tax. It was assumed throughout the survey that a person who owned a structure would be more interested in protecting it than a renter, and would be better informed on alternative methods of attaining protection. The limitations imposed by the above qualifications resulted in a sample size of seventy-five. Although no social or economic criteria were established for the survey, the sample does suggest how some flood plain residents react to the flood hazard. It is emphasized, however, that conclusions for other study areas cannot be based on this sample. The sample is small and from only one of the study areas. The responses are further biased because the sample area is downstream from several large, locally known Corps of Engineers flood control structures.

The Questionnaire

The seventeen-question survey (Appendix A) can be divided into four parts. Part one is an introduction composed of questions one through three. The introductory phase of the questionnaire directs the respondent's attention to the relation between the structure he owns and the subject of floods. Section two involves questions four through eight and is designed to document whether or not the flood plain occupant knows he is living in a hazardous area and how he feels

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shown within the 100-year flood plain was unoccupied agricultural land. Neither the Jackson County nor the Josephine County FIA maps show the 100-year flood plain.

*** T16S R4W S35 and S36; T17S R4W, S1 and S2. Based on the Willamette Meridan. FIA Flood Hazard Map No. 1-41-039-0000-14.

about development on the 100-year flood plain. Section three, questions nine through fifteen, is used to test if the flood plain occupant knows about insurance and if he will purchase coverage under the program. The final questions seek to establish how most people in a hazardous area get their emergency information in time of, and just prior to, disaster.

The questionnaire was pre-tested on eight people who live on the 100-year flood plain in and around Junction City, Eugene, and Corvallis, Oregon. Suggestions in clarifying questions and answers were incorporated into the survey before final distribution.

The survey was completed through the mail, although it was not initially intended as a mail survey. A post card explaining the purpose of the survey and background of the researcher was sent first. Two days later, the survey was sent with a cover letter again explaining the purpose of the survey and who the researcher was. The author then attempted to hand collect the survey during the evening (between seven and ten) five days later. Although it had been determined from review of other surveys that this technique would guarantee a larger response than a mail return, hand collection proved ineffective. Of the homes contacted most said they had not had time to answer the survey, or there was no one home.

The day following the attempted collection the survey was again mailed, this time with a self-addressed, stamped envelope included. The questionnaires were numbered and a week later a post card was sent to those who had not responded. This approach produced better results: fifty-four responses were received. Of the fifty-four, three people had moved and one was deceased. The questionnaire was forwarded to

the three people who had moved. They answered the questionnaire and returned it. The questionnaire to the deceased was returned unopened. All four were disqualified as the subjects no longer inhabited the structure referred to in the questions. Fifty questionnaires were considered valid for a 67% return.

Appendix A lists the results from the fifty valid questionnaires. From these results, frequency distributions were tabulated with the assistance of Dr. P. Schilling of the Experimental Statistics Department, Louisiana State University. Forty-nine variables were tabulated to determine the frequency distributions.

Conclusion

Impact of the Insurance Program on State Level Organization

It is difficult, if not impossible, to separate all of the consequences of the Act from the normal evolution of flood plain management at the state level. Statewide land use regulations had been seriously discussed in Oregon for the past decade. The study did determine that the NFIA had only limited effect on state level organizations. First, by July 1972, no new state-enabling acts giving counties and cities enlarged powers to zone, plan, or establish subdivision regulations and building codes were passed in Oregon as a result of the insurance act. Oregon cities acquire their powers to regulate development by the Home Rule provisions of the Oregon Constitution, by power implied in City charters, by authority granted cities without charters and/or by explicit powers authorized by state law. Counties were limited to those powers granted by a 1947 statute; however, in 1958 they were

allowed to seek Home Rule charters. Expanded county planning powers were enacted in 1963.

Second, the study determined that in 1966, two years before the Act became operative, flood plains were already recognized by a state level agency (the Bureau of Municipal Research and Services) as unique and deserving a separate zoning code.

Third, the possibility of managing the flood plain to reduce flood losses was available before the National Flood Insurance Act, although not widely used. Dissemination of the concept was through Section 206 of PL 86-645 in 1960. This statute authorized the Army Corps of Engineers to furnish, upon request of local officials, Flood Plain Information Studies. These studies were to provide "information on flood hazards to serve as a guide to such development, as a basis for avoiding future flood hazard by regulation of use by States and municipalities..." (PL 86-645, Section 206). The first such study in Oregon was begun in 1961 for Lane County. The Summary Report (November, 1964) states:

> A locally instituted and enforced program of Flood Plain Management would be a valuable supplement to existing and future flood control works. It would tend to reduce the cost of future floods by placing a degree of responsibility for damage prevention on the users of the flood plain.

Fourth, the State Water Resources Board, the state coordinator of water basin development, had a designated, fulltime flood plain specialist by 1965. No additional positions dealing with flood plains or their use are known to have been formed as a result of the NFIA.

Finally, the NFIA prompted the Bureau of Governmental Research and Service to issue Flood Plain Management for Oregon Cities and Counties

(1969, revised 1971). This was the first state publication on flood plain management in Oregon. The report, partially funded through a Department of Housing and Urban Development 701 grant, is a brief discussion of the local government responsibility for managing flood plains, the legality and purpose of potential regulations, a summary of the management programs in effect by August 1969, and a review of the requirements of the Flood Insurance Act of 1968. The volume informed jurisdictions throughout the state that legislation in effect by 1969 was sufficient to enact flood plain regulations, and that these regulations may be designed to qualify the area for flood insurance.

Impact of the Insurance Program at the Local Level of Organization

The National Flood Insurance Act and its accompanying regulations had greater impact at the local level of government than at the state level. Six counties* and five cities** initiated flood plain regulations in order to become eligible for flood insurance. Over fifty percent of the governments of the study areas would not have instituted flood plain regulations, at least not as soon as they did, had it not been for the assistance provided flood victims by the insurance program.

Standardization of technical reports, needed by local governments for participation in the insurance program, resulted in the designation

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*Curry, Douglas, Jackson, Marion, Multnomah, Umatilla

**Gladstone, Pendleton, Portland, Salem, Winston

of the 100-year flood level as the unifrom flood plain limit. Of the four flood plain management programs in effect when flood insurance was enacted, only Washington County had defined a specific flood frequency, the fifty-year flood plain. Lane County, Roseburg, and Prineville had defined the regulated areas as those subject to flooding, thus providing no frequency on which to systematically establish limits. If the practice of each planning unit setting its individual flood plain limits had continued, a major problem would have developed in statewide coordination of flood plain programs. Some programs may have been so vague and lax as to be ineffective in reducing flood losses by permitting structural development which would increase frequency and depth of flooding in adjacent areas.

In addition to defining the maximum extent of the flood plain, the standards for the NFIA divide the flood plain into the floodway and the floodway fringe and designate the allowable uses for each. None of the four programs in effect before the NFIA had such a division of the flood plain or so specific a set of standards. The division of the flood plain is a more efficient allocation of the use of hazardous areas, because the degree of control is proportional to potential destruction. Thus, floodways are strictly regulated because they are subject to more frequent and destructive flooding than the floodway fringe.

All local flood plain management programs analyzed in the study need some alteration in order to meet the final minimum standards established by the Federal Insurance Administration. Regulations passed so far indicate decision-makers do not fully understand what is expected by the prerequisites for insurance. Even the most complete regulation,

that of Clackamas County, has omitted some requirements which must eventually be included to meet FIA regulations. In the study area regulations, four standards are most commonly omitted:

1. Section 1910.3d6 on fill in the floodway
2. Section 1910.3b7ii on raising utilities above the 100-year flood level
3. Section 1910.3b7iii on adequate drainage
4. Section 1910. 3b1 on considering neighboring flood plain programs

when instituting such a program.

Summary of Survey Results

Eighteen residents lived in their homes for nine or more years. These people had first-hand experience with the 1964 flood, the last major flood in the area and the basis for the FIA maps. During that flood ten families had water in their street or in the immediate neighborhood, and eight others had water in their homes up to a depth of thirty-six inches. Five of the flood victims did not know flood insurance was available but, of those who did know, none indicated they would buy it (Table 6).

Twenty-eight of the sample felt living in the 100-year flood plain was not overly hazardous, but none indicated they would live within the five-year flood plain. The respondents seemed to understand the concept of a frequency of flood potential of an area although they could not relate these numbers to any actual flood heights. Not one of the respondents, who experienced flooding, felt a flood of the 1964 magnitude would occur again and only one-third of the more recent

TABLE 6

Frequency of Q 10 and

Q 11 when Q 3 is yes

	Q 11 is yes	Q 11 is no	Q 11 is Don't Know
Q 10 is yes	0	3	0
Q 10 is no	1	1	0
Q 10 is Don't Know	2	1	0

Q 3. Has this structure been flooded since you have lived here?

Q 10. Is there any kind of insurance available which covers flood damage?

Q 11. Would you buy insurance if it were available at 25 cents/year for each $100 of value on contents and building? For example, $50 per year on a $20,000 house and $12.50 on $5000 contents.

residents thought such a flood was possible.

Fifty-four of ninety-one responses (Question 7) favored restricting development on the 100-year flood plain to open space uses and agriculture. Nonetheless, they felt that if the government permits development, it is responsible for warning citizens that their homes and property are subject to flooding, whatever the frequency. Most of the respondents stated that even after governments warn potential victims, the governments should still help flood victims through loans, tax breaks, and grants.

Only thirty-six percent of the respondents knew flood insurance was available (Table 7). Only four of the eighteen home owners who knew of insurance would purchase it. Judging from the responses in Table 7, most respondents would not object to zoning, subdivision regulation, and building codes for flood-prone areas, which limit uses to open space and agriculture. In other words, government could have a direct influence on disposal and use of private property provided it furnishes assistance to flood victims. These same people preferred dams, levees, and/or channel improvements to reduce flood losses. The popularity of the engineering approach remains high and might be a result of inadequate information on the part of the general public, as most feel more material is desirable. One resident commented: "The only available information now is from neighbors." Information on floods and flood relief would most effectively be transmitted in order of preference, by newspaper, television news, radio, and television specials.

Table 7 shows some interesting clusterings of responses. Most people who answered affirmatively to Question 11 (Would you purchase

TABLE 7

Frequency of Q4, Q10, and Q11 on Q7, Q12, and Q14

		7A	7B	7C	7D	7E	7F	12A	12B	12C	12D	12E	12F	14A	14B	14C
Q4 is yes; Q10 is yes; Q11 is yes;	Total is 2		1	1	1	1	1	1	1		1			1	1	
Q4 is yes; Q10 is yes; Q11 is no;	Total is 7	1	2	2	1	3	5	4	2		3		1	2	3	1
Q4 is yes; Q10 is yes; Q11 is Don't know;	Total is 1				1				1						1	
Q4 is yes; Q10 is no; Q11 is no;	Total is 2				2			2							2	
Q4 is yes; Q10 is no; Q11 is Don't know;	Total is 1				1				1						1	
Q4 is yes; Q10 is Don't know; Q11 is yes;	Total is 6	4	1			5	3	1	4	1	1			2	4	
Q4 is yes; Q10 is Don't know; Q11 is no;	Total is 3	2	1	1	2	1	1	1		1	1			1	2	
Q4 is yes; Q10 is Don't know; Q11 is Don't know;	Total is 6	2	1	1	2	3	2	5		1	2			1	5	
Q4 is no; Q10 is yes; Q11 is yes;	Total is 2					2	1		2						2	
Q4 is no; Q10 is yes; Q11 is no;	Total is 4	1	1	1	1	1	4	1		2	1		1	3	1	
Q4 is no; Q10 is yes; Q11 is Don't know;	Total is 2					1	1		2						2	
Q4 is no; Q10 is no; Q11 is yes;	Total is 3					3	1		2		1				3	
Q4 is no; Q10 is no; Q11 is no;	Total is 1			1						1					1	
Q4 is no; Q10 is Don't know; Q11 is yes;	Total is 2					1	2	1	1					2		
Q4 is no; Q10 is Don't know; Q11 is no;	Total is 6			1	1	4	3	1	1	1	1	3	1	1	4	1
Q4 is no; Q10 is Don't know; Q11 is Don't know;	Total is 2					2	1	1	1						2	

Q4. Would you live in this location if you knew there was a one chance in a hundred your house would be flooded each year? The area is sometimes called the one-hundred year flood plain.

Q10. Is there any kind of insurance available which covers flood damage?

Q11. Would you buy insurance if it were available at 25 cents/year for each $100 of value on contents and building? For example, $50 per year on a $20,000 house and $12.50 per year on $5000 contents.

Q7. Which of the following should be permitted in the flood plain that has a one chance in a hundred of being flooded each year?

A Homes
B Commercial structures
C Industry
D No restrictions on development
E Golf courses, open space uses
F Agriculture

Q12. If you needed help after a flood, what would be the most desirable way of restoring your property? Select one.

A Loan
B Insurance
C Grant
D Tax break
E Don't need help
F Other (specify)

Q14. Do you feel government should try to reduce flood losses by permitting only selective uses of flood-prone areas by providing dams, levees, and/or channel improvements? Select one.

A Selection uses
B Dams, levees, and/or channel improvements
C No government action necessary

insurance?) also selected insurance (12B) in Question 12, displaying a consistency not common throughout the survey. These people would also restrict development of the 100-year flood plain to open space uses and agriculture. Most of the sample that checked yes under Question 4 (Would you live on the 100-year flood plain?) do not favor restricted flood plain development. In contrast, those who checked no under Question 4 would be much more restrictive of flood plain uses, i.e., favoring open space uses and agriculture. However, the same people who are opposed to intensive flood plain development would prefer more dams and levees. Most notably, of the ten respondents, who said they would live on the 100-year flood plain and knew about insurance, seven said they would not purchase it and one did not know if he would purchase it or not. A seventy percent rejection rate is very high and suggests that an indepth study is needed to determine if this sample area is representative of the state, and, if it is, why insurance is being rejected.

For the most part, people who chose a form of government help to recover from flooding, were consistent in their choices (Table 8). In Questions 9 and 12, they ranked loans, tax breaks, and grants in decreasing order of preference. Given the choice of insurance, they would choose it as often as a loan. These are the people, it must be noted, who do not know the details of insurance, because seventy percent who are informed about insurance would reject it.

Eighty-eight percent of the respondents indicated that local authorities should warn potential victims that their homes and property were subject to flooding (Table 9); most of them also felt that insufficient information was presently available. Table 10 shows that

TABLE 8

Frequency of Question 12 on Question 9.

		A	B	C
12A	18 yes	16	9	3
12B	18 yes	14	12	9
12C	7 yes	3	4	3
12D	11 yes	6	9	4
12E	3 yes	0	0	0
12F	3 yes	2	2	0

Q12. If you needed help after a flood, what would be the most desirable way of restoring your property? Select one.

A	Loan	C	Grant	E	Don't need help
B	Insurance	D	Tax break	F	Other (specify)

Q9. Do you think the federal government should help flood victims through any of the following:

A	Yes	Loans	A	No
B	Yes	Tax breaks	B	No
C	Yes	Grants	C	No

TABLE 9

Frequency of Question 8 on Question 16.

	Q16 is yes	Q16 is no	Q16 is Don't know
Q8 is yes	9	27	8
Q8 is no	4	0	2

Q8. Do you feel local governments should warn citizens that their homes and property are subject to flooding, whatever the frequency?

Q16. Do you feel sufficient information on flooding is presented to the general public?

TABLE 10

Frequency of Question 4 on Questions 8 and 16.

	Q8 is yes	Q8 is no	Q16 is yes	Q16 is no	Q16 is Dont' know
Q4 is yes	24	4	10	13	5
Q4 is no	20	2	3	14	5

Q4. Would you live in this location if you knew there was one chance in a hundred your house would be flooded each year? The area is sometimes called the one-hundred year flood plain.

Q8. Do you feel local governments should warn citizens that their homes and property are subject to flooding, whatever the frequency?

Q16. Do you feel sufficient information on flooding is presented to the general public?

TABLE 11

Frequency of Question 11 on Question 13.

	Q13 is yes	Q13 is no	Q13 is Don't know
Q11 is yes	9	3	3
Q11 is Don't know	9	1	2

Q11. Would you buy insurance if it were available at 25 cents/ year for each $100 of value on contents and building? For example, $50 per year on a $20,000 house and $12.50 per year on $5000 contents?

Q13. Should the federal government require restrictive zoning laws, subdivision regulations, and building codes for flood-prone areas after they furnish aid to flood victims?

sixty-eight percent of the respondents, who said they would not live on the 100-year flood plain, felt more information is needed; and that forty-six percent, who said they would live on the 100-year flood plain, still felt they should have more information. More information would indeed appear to be necessary as forty-four percent of the respondents did not know they lived on the 100-year flood plain. Some flood plain occupants do not have insurance, even though they would purchase it if they realized it was available. Whether many in the sample area would purchase insurance is debatable, however, as a majority of those in this sample who do know about insurance would not buy it. If these people do not purchase insurance (Table 11), they may receive little or no help from the government after the next flood, as insurance has been available for this.

Finally, the respondents indicated the four most effective ways to disseminate flood and flood relief information are through newspapers, television news, the radio, and television specials (Table 12). Since these are the most effective media by which to pass information, they may also be the best means by which to explain the flood insurance program. However, White (1973) reports people are rarely influenced by government administrators. He concludes (p. 163):

> There is little evidence that information in reports, brochures, movies, and radios is linked with value shifts. Television does, however, have an element of immediacy that strengthens preferences and judgements developed from other sources.

One of the objectives of the NFIA is to assist flood victims in rebuilding their homes and businesses. In order to produce the desired result, a flood plain occupant must know his home in in a hazardous area. Without this knowledge he has no reason to believe

TABLE 12

Frequency of Question 16 on Question 17 flood.

	17A	17B	17C	17D	17E	17F	17G	17H	17I
Q16 is yes	5	7	10	8	0	1	2	1	0
Q16 is no	6	23	16	23	2	1	3	1	3
Q16 is Don't know	4	8	3	9	0	0	3	0	0

Frequency of Question 16 on Question 17 flood relief.

	17A	17B	17C	17D	17E	17F	17G	17H	17I
Q16 is yes	4	7	8	9	0	1	1	0	1
Q16 is no	8	20	14	19	1	3	3	1	4
Q16 is Don't know	3	8	3	8	0	0	1	1	0

Because of the confused reaction to the instructions, the cumulative responses are presented.

Q16. Do you feel sufficient information on flooding is presented to the general public?

Q17. From which of the following sources do you get your information about floods and flood relief? In each column, place a one (1) by your main source, a two (2) by the next source, and a three (3) by the third source.

FLOODS		FLOOD RELIEF	
Question	Category	Question	Category
A	TV specials	A	TV specials
B	TV news	B	TV news
C	Radio	C	Radio
D	Newspapers	D	Newspapers
E	Local meetings	E	Local meetings
F	Circulars	F	Circulars
G	Word of mouth (neighbors)	G	Word of mouth (neighbors)
H	Other (specify)	H	Other (specify)
I	No information on floods available	I	No information on floods available

he needs insurance. He must be informed that flood insurance is available in the community so he can take advantage of the program. He must also be willing to purchase insurance in that the policies are the vehicle the government employs to assist flood victims to restore their homes and businesses. If flood plain occupants do not purchase insurance, the program is ineffective and it has not achieved one of its two major objectives. Before flood insurance can be widely sold, however, people must receive sufficient information on the availability of flood insurance and on hazardous conditions from authorities.

Forty-four percent of the respondents did not realize they lived on the 100-year flood plain; hence they had no reason to believe they needed any form of insurance. Sixty-four percent did not know that insurance was available to cover flood damages. The majority of the sample could not take advantage of a program they did not know was designed for their benefit. More information is necessary, but it is uncertain how effective it will be.

Of the respondents who knew they could purchase insurance through their local agent, seventy percent would not buy it, twenty percent would purchase it, and ten percent were undecided. Consequently in time of flood, only two or at the most three out of ten would be assisted by the program. Most of the residents questioned feel dams, levees, and channel improvements are the best means to reduce flood losses. These people, however, were most probably biased towards dams due to the proximity of numerous Corps of Engineers reservoirs on the Willamette and McKenzie River watersheds, upstream from the sample area.

Sale of flood insurance in Lane County is relatively low. As of June 1973, only seventy-four policies have been sold (Table 13) in the state's second most populous county. By contrast, in Douglas County, with one-third the population of Lane County, residents have purchased four times the number of policies. The survey area in Lane County and much of the population in the county are downstream from several large flood control structures which have markedly lowered flood crests. In Douglas County, very little flood control is present. It would appear that additional studies are warranted to determine the relationship, if any, between upstream control structures and the sale of flood insurance.

TABLE 13

Number and value of flood insurance policies sold in the study area as of June 1973

Area	Number of Policies	Coverage
Clackamas County	239	3, 671, 000
Curry County	66	1, 013, 000
Douglas County	316	4, 283, 000
Grant County	3	40, 000
Jackson County	189	2, 687, 000
Josephine County	125	1, 502, 000
Lane County	74	1, 052, 000
Marion County	50	683, 000
Multnomah County	191	1, 743, 000
Polk County	8	118, 000
Umatilla County	44	611, 000
Cities		
Gladstone	3	67, 000
John Day	3	20, 000
Milwaukie	16	268, 000
Myrtle Creek	17	136, 000
Pendleton	8	99, 000
Portland	383	6, 047, 000
Roseburg	47	612, 000
Salem	14	188, 000
Springfield	2	34, 000
Winston	2	28, 000

Source: State Water Resource Board

APPENDIX

QUESTIONNAIRE TO FLOOD PLAIN OCCUPANTS IN LANE COUNTY

1. Do you own the structure in which you live?

   49 Yes 0 No 1 blank

2. If yes, for how many years have you lived here?

   Number of years _____

3. Has this structure been flooded since you have lived here?

Year flooded	Depth of flooding
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

4. Would you live in this location if you knew there was a one chance in a hundred your house would be flooded each year? The area is sometimes called the one-hundred year flood plain.

   28 Yes 22 No

5. Would you live in this location if you knew there was a one chance in five your house would be flooded each year? The area is sometimes called the five year flood plain.

   _____ Yes 49 No 1 question mark

6. Do you think a flood of the same magnitude as the 1964 flood will happen again in your lifetime?

   13 Yes 20 No 17 Don't know

7. Which of the following should be permitted in the flood plain that has a one chance in a hundred of being flooded each year?

a. 10 Homes
b. 7 Commercial structures
c. 7 Industry
d. 13 No restrictions on development
e. 29 Golf courses, open space uses
f. 25 Agriculture

8. Do you feel local governments should warn citizens that their homes and property are subject to flooding, whatever the frequency?

44 Yes 6 No

Comment:

9. Do you think the federal government should help flood victims through any of the following:

a.	35 Yes	Loans	3	No
b.	27 Yes	Tax breaks	6	No
c.	18 Yes	Grants	7	No
d.	____ Yes	No help	____	No

Comments:

10. Is there any kind of insurance available which covers flood damage?

18 Yes 7 No 25 Don't know

1 says Lloyd's of London

11. Would you buy insurance if it were available at 25 cents/year for each $100 of value on contents and building? For example, $50 per year on a $20,000 house and $12.50 per year on $5000 contents.

15 Yes 23 No 12 Don't know

Comments:

12. If you needed help after a flood, what would be the most desirable way of restoring your property? Select one.

a. 18 Loan
b. 18 Insurance
c. 7 Grant
d. 11 Tax break
e. 3 Don't need help
f. 3 Other (specify)

13. Should the federal government require restrictive zoning laws, subdivision regulations, and building codes for flood-prone areas after they furnish aid to flood victims?

31 Yes 12 No 5 Don't know

Comments:
2 blanks

14. Do you feel government should try to reduce flood losses by permitting only selective uses of flood-prone areas or by providing dams, levees, and/or channel improvements. Select one.

a. 10 Selective uses
b. 36 Dams, levees, and/or channel improvements
c. 3 No government action necessary
1 blank

15. If you marked "selective uses" in question 14, what should these uses include?

16. Do you feel sufficient information on flooding is presented to the general public?

13 Yes 27 No 10 Don't know

Comments:

17. From which of the following sources do you get your information about floods and flood relief? In each column, place a one (1) by your main source, a two (2) by the next source, and a three (3) by the third source.

	FLOODS		FLOOD RELIEF	
a.	15	TV specials	15	TV specials
b.	38	TV news	35	TV news
c.	29	Radio	25	Radio
d.	40	Newspapers	35	Newspapers
e.	2	Local meetings	1	Local meetings
f.	2	Circulars	4	Circulars
g.	8	Word of mouth (neighbors)	5	Word of mouth (neighbors)
h.	2	Other (specify)	2	Other (specify)
i.	3	No information on floods available	4	No information on flood relief available

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