

14132

BY THE COMPTROLLER GENERAL
**Report To The Chairman And Ranking
 Minority Member Senate Committee
 On The Budget United States Senate**
 OF THE UNITED STATES

**Federal Disaster Assistance:
 What Should The Policy Be?**

RESTRICTED — Not to be released outside the General Accounting Office except on the basis of specific approval by the Office of Congressional Relations.

RELEASED

Three forms of assistance are presently available: loans, grants, and insurance. Some tax transfers are a form of assistance which increases the Government's risk while escaping disaster budget scrutiny.

In formulating Federal disaster policy, two economic principles should be considered:

- equity--consistency of assistance among victims, for different disasters, and over time; and
- efficiency--the influence of the policy on potential victims' willingness to risk disaster losses.

The policy should embody the notion that those losing the most--proportionately--from a natural disaster should receive the most assistance and that the availability of assistance should minimize the possibility of contributing to poor locational decisions. GAO believes that the most efficient and equitable form of assistance is insurance.



511109



COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-197655

The Honorable Ernest F. Hollings,
Chairman
The Honorable Henry Bellmon,
Ranking Minority Member
Committee on the Budget
United States Senate

This is the second report in response to your December 15, 1978 request. This report examines the Federal financial role in disaster assistance to determine what it and the relevant guiding principles should be.

The report discusses the five major Federal disaster assistance programs and examines the three generic forms of assistance embodied in them to provide you with this view. We also address the specific questions you asked.

We requested written agency comments by letter dated March 12, 1980, from the Department of Agriculture, the Small Business Administration, and the Federal Emergency Management Agency. The Small Business Administration and the Department of Agriculture did not provide written comments. The Federal Emergency Management Agency's comments did not arrive within the allotted 30-day period, but have been included for your information.

As arranged with your office, unless you publicly announce the contents earlier, no further distribution of this report will be made until 30 days after the report date. At that time, we will send copies to interested parties and make copies available to others upon request.

A handwritten signature in cursive script, reading "Milton J. Fowler".

Acting Comptroller General
of the United States

D I G E S T

The Government's role in providing assistance for losses from natural disasters is defined by the proportion of financial risk it is willing to bear on behalf of society. However, the actual role is not clear-cut, and varies with programs, individuals, and disasters.

GAO takes no position on what the optimal role should be. That decision is a value judgment made by political decisionmakers. Even so, analyzing the current design and operation of disaster assistance programs suggests principles for a more equitable and efficient policy. (See chapters 2 and 3.)

Federal disaster assistance is provided to the private sector through five major programs:

- The Small Business Administration's disaster loan program. (See p. 5.)
- The Farmers Home Administration's emergency loan program. (See p. 7.)
- The Disaster Payments Program, under the U.S. Department of Agriculture. (See p. 9.)
- The Federal Crop Insurance Program, administered by the Federal Crop Insurance Corporation. (See p. 9.)
- The National Flood Insurance Program, managed by the Federal Emergency Management Agency. (See p. 11.)

These programs are intended to serve different types of disaster victims, but some groups

are eligible for benefits under several programs.

GAO believes disaster assistance policy should be based on economic welfare considerations of equity and resource allocation efficiency. (See chapter 3.)

Equity implies that Federal disaster assistance should not vary across income classes. However, the tax code makes the Government bear a higher share of losses for higher income victims than for lower income victims. (See p. 16.)

Consistency, another part of equity, means that victims of similar natural disasters who experience similar losses will be accorded the same benefits and bear a similar share of the costs. This view suggests two principles.

--Federal disaster relief should vary with the severity of the disaster loss, not the terms on which the programs are subsidized, and

--the severity of a natural disaster should be measured by the extent of individual losses, not the scope of the disaster. (See p. 16.)

A more liberal disaster assistance policy has often been made in the wake of widespread natural disasters. However, victims of these disasters may have lost less than those of, say, an isolated tornado which occurred when disaster assistance was less liberal or not available. Such changes in policy create inconsistencies over time and violate the principle of equity. (See pp. 5, 16-18.)

Natural disasters occur unpredictably, although some occur more frequently in particular locales. While not every disaster loss results from an individual making a poor locational decision, some people

will be less sensitive to the risk of locating in hazard-prone areas, knowing that Federal aid exists. Therefore, Federal disaster policy should actively discourage people from locating in known hazard-prone areas, or at least avoid encouraging people to make unwise locational choices. (See chapter 3.)

The five programs we discuss provide three generic forms of subsidized assistance-- loans, grants, and insurance. Each reduces an individual's risk at taxpayers' expense.

LOANS

In general, four factors affect the efficiency and equity of loan programs: interest rate subsidies, the maturity of a loan, principal forgiveness, and the income tax bracket of loan recipients.

The effective cost burden varies among individuals because subsidies change and because, even if a subsidy does not change, nonreimbursed losses and interest payments can be deducted from taxable income on the basis of a progressive system of taxation. The Government therefore bears a larger proportion of the losses of higher income individuals than for lower income individuals, thus subsidizing the rich relatively more than the poor. (See p. 18.)

GRANTS

Grants completely transfer risks covered to society, but if they do not cover total losses, they differ little from insurance in terms of benefits, except they are less costly to program participants. Since grants cost recipients nothing, they are highly inefficient as a policy tool in reducing disaster losses. (See p. 22.)

INSURANCE

GAO believes that insurance is the most efficient and equitable method of providing disaster assistance. Even so, two problems

arise with insurance that reduces its efficiency--moral hazard and adverse selection.

Moral hazard exists when people can control an outcome through their own decisions. In the broadest terms, virtually all subsidized disaster assistance programs involve moral hazard. For example, when comparing the costs of, say, prevention, to the cost of location in hazard-prone areas (and relying on subsidized assistance), prevention may not be chosen because it is more "costly," and the incidence and magnitude of loss may increase. (See p. 22.)

Adverse selection occurs when insurance premiums are based on average premiums set to cover a fairly broad spectrum of risks. Some individuals correctly perceive their risk as smaller than that implied by the premium. These individuals choose not to insure, participation is lowered and the more risky individuals remain in the program. (See p. 24.)

GAO believes the following criteria should be recognized in designing disaster assistance programs. (See p. 24.)

- Assistance programs should be designed to minimize incentives for poor locational decisions.
- Likes should be treated alike within programs, across programs, and over time. The generosity of programs should depend on the severity of the disaster, not on variations in program terms. Severity should be measured on the basis of individual losses, not necessarily on the scope of the disaster.
- No individual or group of individuals should be able to improve on their pre-disaster state as a result of disaster assistance unless such an improvement would result in less cost to the Government in future disasters.

Insurance programs are inherently more consistent over time than loans, whose availability is triggered by and, and whose terms are the result of, political decisions. Thus, the principles that should guide formulating disaster assistance policy indicate that both in theory and in practice insurance is more appropriate than loans and grants. In practice, insurance produces lower differences in income and wealth distribution among victims and between victims and taxpayers. (See p. 25.)

These specific issues of interest to the Senate Budget Committee are also discussed.

- Should eligibility be restricted to individuals who cannot obtain credit from other sources? (See p. 28.)
- Should Federal loans for the repair or replacement of luxury facilities be prohibited? (See p. 29.)
- Should loans for damaged homes and personal property be targeted for low-income individuals? (See p. 30.)
- What rates of interest should be charged on disaster loans? (See p. 31.)
- How can the Federal Government avoid assuming risks that should properly be borne by private individuals and firms? (See p. 33.)
- Are there circumstances under which other methods of dealing with agricultural disasters would be preferable to the current disaster loan programs? (See p. 35.)

The answers to these questions reemphasize the advantages of insurance.

AGENCY COMMENTS

By letter dated March 12, 1980, GAO requested written comments from the Small Business

Administration, the Department of Agriculture, and the Federal Emergency Management Agency. Official agency comments from the Federal Emergency Management Agency are contained in appendix III. Because these comments did not arrive within the 30-day period allotted for comments, they are included mainly for information. The Small Business Administration and the Department of Agriculture did not formally respond with comment. GAO officials discussed the report with officials of the agencies. In general, the agency comments were editorial or provided updated information, and expressed regret that GAO chose not to report on other disaster assistance programs the agencies administer. GAO has incorporated the updated information in this report.

C o n t e n t s

		<u>Page</u>
DIGEST		i
CHAPTER		
1	INTRODUCTION	1
	Scope and methodology	1
	Current programs	3
2	DISASTER ASSISTANCE PROGRAMS	4
	Major legislative actions	4
	Program descriptions	5
	Loan programs	5
	Small Business Adminis- tration	5
	Farmers Home Administration	7
	Direct payment program	9
	Insurance programs	9
	Federal Crop Insurance	9
	National Flood Insurance	11
3	CHOICES AMONG ALTERNATIVE FORMS OF ASSISTANCE	13
	Aid vs. no aid: A trade-off of policy	13
	Efficiency	15
	Equity	16
	Efficiency and equity of each form of assistance	18
	Loans	18
	Grants	22
	Insurance	22
	Criteria for designing a disaster assistance program	24
	Meeting the criteria	25
4	SPECIFIC ISSUES REGARDING PROGRAM CHANGES	28
	Should eligibility be restricted to individuals who cannot obtain credit from other sources?	28
	Should Federal loans for repair or replacement of luxury facilities be prohibited?	29

CHAPTER		<u>Page</u>
	Should loans for damage to homes and personal property be targeted for low-income individuals?	30
	What rates of interest should be charged on disaster loans?	31
	How can the Federal Government avoid assuming risks that should properly be borne by private individuals and firms?	33
	Are there circumstances under which other methods of dealing with agricultural disasters would be preferable to current disaster loan programs?	35
5	CONCLUSIONS AND AGENCY COMMENTS	40
	Insurance is preferred by the Federal Government	41
	Agency comments	42
 APPENDIX		
I	Generic forms of assistance: technical implications	43
II	Formulas	55
III	Agency comments	57
IV	Letter dated December 15, 1978, from Senators Edmund S. Muskie and Henry Bellmon	63

ABBREVIATIONS

FCI	Federal Crop Insurance
FCIC	Federal Crop Insurance Corporation
FEMA	Federal Emergency Management Agency
FmHA	Farmers Home Administration
GAO	General Accounting Office
NFIP	National Flood Insurance Program

CHAPTER 1

INTRODUCTION

The Senate Budget Committee requested that we broadly consider what the Federal role in disaster policy should be, what principles are relevant in determining the Federal role and in specifying program provisions, what types of beneficiaries should be aided, and how the Federal role should vary with the type of disaster. We were also asked to address their questions concerning Federal disaster loan program changes. The request was prompted by the large increase in loan volume in 1978, which created budget problems and raised questions about the appropriateness of the current disaster loan programs.

Federal disaster assistance is available to State and local governments, as well as individuals, businesses, and farmers. Each generic form of assistance (loans, grants, and insurance) uses subsidies. A subsidy, obtained from the taxpayers, reduces the financial risk of potential or actual disaster victims.

The public's willingness to bear a portion of disaster losses dates back to the early 1930s. Hazard mitigation policy was formally institutionalized then when the Congress legislated flood control projects. Financial assistance policy was also formalized during the same period with a crop insurance program. Other programs reimbursing property losses were formally instituted in the late 1940s and early 1950s.

SCOPE AND METHODOLOGY

The Committee requested that our inquiry be a normative one--in a sense, a guidelines document. Now an extensive inquiry into the appropriate Federal role in providing disaster relief should consider all means by which assistance is provided to the public and private sectors. But we limit the scope of this inquiry considerably. We describe how financial assistance should be provided directly to the private sector and discuss how well current programs do this. ^{1/} Recent congressional interest has centered on these issues.

^{1/}Any assistance provided to State and local governments also indirectly benefits the private sector because local infrastructures may be rehabilitated under these programs. However, these programs do not pose the same equity and efficiency problems that direct financial assistance programs pose, and are therefore not covered in this inquiry.

While we have found insurance to be the superior mechanism for providing disaster assistance, we are in no position to specify all the features of its design. Thus, while we do suggest policy and program changes, we do not make specific recommendations to the Congress.

Until a system of insurance is fully operational, alternative forms of assistance will still be required, such as loans. However, the design and administration of these loan programs need to be improved.

Although we are unable to offer analytical solutions to determine the appropriate degree of private versus social risk-sharing, we are able to present guiding principles for the formulation of such a policy. Comparing the current design and operation of disaster assistance policy with such principles is important in designing alternatives that will deliver assistance to disaster victims more equitably and efficiently.

Normative disaster assistance policy is based on economic welfare considerations of equity and efficiency. Equity is the consistency of assistance awarded among victims of different disasters, among similarly affected victims of the same disasters, and over time. Efficiency is the influence upon a person's decision to live or do business in a particular place.

Each form of assistance has its own advantages and disadvantages with respect to the principles of a well-designed assistance program. In general, such a program should:

- treat likes alike (horizontal equity);
- deliver assistance to those most in need (vertical equity), given a disaster budget constraint;
- discourage location or production in hazard-prone areas, or, on the other hand, encourage mitigation to avoid hazards;
- protect individuals, businessmen, farmers, etc., from bankruptcy;
- achieve better control over budgeting for natural disaster; and
- improve the cost-effectiveness of programs.

Though no one form of assistance meets all of the above principles, we have found that insurance stands out as the best choice in satisfying the criteria.

CURRENT PROGRAMS

The Federal Government currently provides disaster assistance to the private sector through five major programs:

- The Small Business Administration's disaster loan program.
- The Farmers Home Administration's emergency loan program.
- The Disaster Payments Program under the U.S. Department of Agriculture.
- The Federal Crop Insurance Program, administered by the Federal Crop Insurance Corporation.
- The National Flood Insurance Program, administered by the Federal Emergency Management Agency.

The extent of the Government's role in providing relief from natural disasters is defined by the proportion of financial risk it is willing to bear on behalf of society. What proportion is appropriate, however, is unclear. The level of risk-sharing borne by the Federal Government on behalf of society is a political decision based on value judgments. We take no position on what level is appropriate.

We believe that the larger the share of total disaster losses paid for by taxpayers, the less efficient will be individual decisions in locating housing, business, and agricultural activity. On the other hand, the smaller the role played by taxpayers, the more difficult it will be for disaster victims to recoup losses or avoid financial ruin.

CHAPTER 2

DISASTER ASSISTANCE PROGRAMS

Since its creation in 1932, a formal Federal disaster assistance policy has evolved from one program administered by one agency to five major programs administered by four agencies (although many agencies and offices are involved in some aspect of disaster relief). The Federal Emergency Management Agency (FEMA) coordinates Federal disaster assistance activities. This structure evolved from many legislative actions, many of which were responses to particular disasters.

MAJOR LEGISLATIVE ACTIONS

The major programs currently providing disaster assistance were established or revised by seven major legislative actions. The Reconstruction Finance Corporation was created in 1932 and the Disaster Loan Corporation (whose functions were transferred to the Reconstruction Corporation in 1945) was created in 1937. In 1938, Title V of the Agricultural Adjustment Act created the Federal Crop Insurance Corporation (P.L. 75-430), one of the three disaster assistance functions within the Department of Agriculture. In 1949, P.L. 81-38 established the Farmers Home Administration's (FmHA) emergency loan program. The Small Business Act of 1953 Title 2 (P.L. 83-163) established another emergency loan program within the Small Business Administration (SBA). No additional programs were created for 15 years, until the National Flood Insurance Act of 1968 (P.L. 90-448) Title XIII established a flood insurance program in the Department of Housing and Urban Development. (This function was transferred to FEMA by Executive Order 12148, effective July 15, 1979.) The National Flood Insurance Act was followed 5 years later by the Agriculture and Consumer Protection Act of 1973 (P.L. 93-86), which initiated payments to farmers for certain crop losses, the Department of Agriculture's third major disaster assistance program. The Disaster Relief Act of 1974 (P.L. 93-288) concentrated the power to direct and supervise most Federal disaster assistance in the office of the President and authorized additional disaster relief programs. Under Executive Order 11795, July 11, 1974, the Secretary of Housing and Urban Development was designated to coordinate the Federal Government's diffused response to natural disasters. Under this designation of the President's power the Federal Disaster Assistance Administration was created in the Department of Housing and Urban Development. Executive Order 12148 transferred most of these functions to FEMA.

Interspersed among these legislative actions were other legislative changes that modified programs of existing agencies

Some were enacted in response to particular natural disasters. For example, following the Alaska earthquake in 1964, the Congress passed P.L. 88-451; following Hurricane Betsy, the Congress passed the Southeast Hurricane Disaster Relief Act of 1965 (P.L. 89-339). The 1965 Act liberalized the terms under which both SBA and FmHA could offer loans to disaster victims. It also initiated a 9-month study on floods and other natural disasters, which recommended the insurance program in the National Flood Insurance Act of 1968. Another act, P.L. 92-385, was passed following Hurricane Agnes in 1972. This legislation also liberalized the lending terms offered by SBA and FmHA; the availability of SBA loans was further liberalized in 1977 with the passage of P.L. 95-89.

PROGRAM DESCRIPTIONS

The major programs encompass all the generic forms of assistance: loans, grants, and insurance. Each program is intended to serve a different class of disaster victims, although some groups, particularly farmers, are eligible for benefits under several programs.

Loan programs

Small Business Administration

One of the main purposes of SBA disaster loan programs is to restore the economic viability of communities that experience a natural disaster. The three types of SBA disaster loans mitigate different types of losses. Physical disaster loans are used to finance repairs or restoration of homes, businesses, and personal property to their pre-disaster status. Economic injury loans are used to provide working capital for businesses whose operations are disrupted by a natural disaster. Product-loss loans are available to businesses in an SBA disaster area whose products are no longer marketable due to contamination or toxicity.

Eligible recipients of SBA physical disaster loans include individuals and organizations within and adjacent to counties declared as disaster areas by the President or SBA. To qualify as an SBA disaster-declared county, the following conditions must be met. Twenty-five homes or 5 businesses or a combination that equals 25 must suffer at least 25 percent uninsured damage, or 200 homes or 40 businesses or a combination that equals 200 must suffer some damage. In such cases, the county where damage occurred and adjacent counties are declared an SBA disaster area and all damaged businesses and residences are eligible for the loan program. There are no citizenship requirements or limitations on the business organizations or individuals eligible for SBA disaster loans.

Furthermore, SBA disaster loans are not limited to those businesses and individuals that do not qualify for credit from conventional sources. However, those who may qualify for credit elsewhere may be charged a higher interest rate.

During FY 1978, loans to farmers accounted for the majority of SBA disaster assistance loan volume. In June 1976, P.L. 94-305 amended the 1953 Small Business Act by authorizing SBA to make financial assistance available to farmers. SBA initially did not consider farmers eligible for physical disaster loans for crop losses caused by natural disasters. In 1977, the SBA revised its position and made farmers eligible for crop loss loans as well.

SBA disburses disaster assistance through direct loans, immediate participation loans, and guaranteed loans. Direct loans, which make up nearly all the loans, are made from SBA appropriations. Immediate participation loans are arranged and jointly owned by SBA and a private financial institution, while guaranteed loans remain in full possession of the private lending institution and SBA guarantees payment of the outstanding balance should the borrower default.

The parameters defining the terms of SBA (and other agencies') loans are:

- interest rate charged;
- dollar limit that can be borrowed;
- percentage of loss covered;
- repayment period;
- deferral period for repayment;
- principal forgiveness; 1/ and
- mortgage refinancing provisions.

Existing mortgages may be refinanced on properties that sustain over 30 percent damage based on the pre-disaster market value of the property. The refinancing is restricted to the amount of actual physical damage or repair costs. The current interest on such refinancing is 8.5 percent.

1/Principal forgiveness is presently not available in SBA loan programs.

Since 1953, SBA loan terms have been temporarily liberalized by the Congress in response to major natural disasters. The most important changes occurred in 1965 following the Alaska earthquake and in 1972 following Hurricane Agnes.

The Southeast Hurricane Disaster Relief Act of 1965 permitted SBA to forgive a part of each disaster loan up to \$1,800. In 1972, after Hurricane Agnes, the Congress further liberalized SBA loan policies with legislation (P.L. 92-385) permitting SBA to forgive the first \$5,000 of each disaster loan and to provide 1 percent interest rates on the remaining portion with a maximum maturity of 30 years. If property damages to a home or business were substantial, SBA, subject to certain conditions, could refinance any mortgage or lien outstanding against the property.

An additional type of SBA loan which is not directly related to the value of the physical damage caused by a natural disaster, is available in presidentially declared major disasters. If a business is a major source of community employment in the SBA-declared disaster area, it may be eligible for unlimited operating loans at interest charges determined by U.S. Treasury borrowing costs. Repayment of these loans may be deferred up to 3 years after the disaster.

Farmers Home Administration

The Farmers Home Administration (FmHA) disaster loan program provides emergency assistance to U.S. citizens who operate a farm business. ^{1/} Loans can be made to corporations, partnerships, or cooperatives if they are primarily involved in farm business. FmHA emergency loans are available when the FmHA State Director authorizes them or when the President declares the county eligible for Federal disaster assistance. Recipients must experience a substantial physical loss or a minimum 20 percent production loss and be unable to obtain credit to cover their disaster losses from a conventional source at reasonable terms and rates as defined by prevailing economic conditions.

Each of three major categories of FmHA emergency loans covers different types of needs: actual loss loans (covering production or physical losses), annual production, and major adjustment loans (real estate and/or operating purposes).

^{1/}This program is one of the few that can help the victim of an isolated disaster.

The requirements of these loans are similar, except the repayment periods and the interest rates. These interest rates are all subsidized by FmHA to some extent. ^{1/} FmHA provides emergency loans with funds made available to the agency, or in cooperation with local banks. In the latter case, FmHA guarantees not more than 90 percent of the principal amount and subsidizes the difference between the 5 percent rate charged the borrower and the maximum rate allowed on guaranteed loans--14 percent--(currently a 9 percent subsidy) as of April 12, 1980. Direct loans are made from FmHA sale of Certificates of Beneficial Ownership and are subsidized in the same way as guaranteed loans.

Since its inception in 1949, the FmHA emergency loan program has been altered in response to severe natural disasters. Two of these were the same disasters that occasioned changes in the SBA loan program. Principal forgiveness was embodied in the 1965 Southeast Hurricane Disaster Relief Act. Refinancing provisions were contained in P.L. 92-385, passed in 1972 after Hurricane Agnes. This legislation also permitted FmHA to forgive the first \$5,000 of each disaster loan and provide 1 percent interest rates on the remaining portion to all disaster victims, regardless of their ability to obtain credit elsewhere. This new grant element caused a sharp increase in FmHA emergency loans to farmers in the latter half of 1972. In turn, FmHA disaster loans were terminated in counties designated as disaster areas. Soon after, the Congress rescinded the \$5,000 forgiveness grants (P.L. 93-24) and increased the annual interest rate on disaster loans from 1 percent to 5 percent and reinstated the "credit elsewhere" test. The current refinancing provisions are contained in P.L. 94-68, enacted August 5, 1975.

One feature common to all FmHA loans is the "credit elsewhere" test. If credit is available to the loan applicant with reasonable rates and terms, the applicant is ineligible for an emergency loan. In keeping with its basic role as that of a lender of last resort, FmHA reviews all borrowers' financial situations after 2 years and every year thereafter to determine if they are able to obtain credit from other sources. Those determined to be able are requested to refinance their emergency loan.

^{1/}By subsidizing the interest rate, FmHA is charging less than the amount charged by a for-profit lender.

Direct payment program

The major direct payment disaster assistance program is the U.S. Department of Agriculture's Disaster Payments Program. It was designed to reduce income losses to producers of wheat, feed grain, upland cotton, and rice who were either prevented from planting eligible crops or getting low yields because of natural disasters. The program is run by the Agricultural Stabilization and Conservation Service.

Producers of feed grains, rice, upland cotton, and wheat who meet program requirements can qualify for disaster payments to help offset losses due to a natural disaster or other causes beyond their control. These direct cash payments are essentially free insurance for growers of the eligible crops, as a program benefit, for complying with the production adjustment requirements of the program. The disaster payments are the only protection offered in areas where crop insurance is not offered (about one-half of the counties in the United States). In counties where both programs are offered, these payments actually compete with crop insurance because they require no premiums.

Pending in the Congress are bills in both the House and Senate that would expand Federal Crop Insurance and eliminate disaster payments by USDA after the 1981 crop year. (See below.) The Administration favors this action and believes that subsidized actuarially sound insurance with farmer paid premiums should replace the current program. We support the concepts behind these bills.

Insurance programs

Federal Crop Insurance

The Federal Crop Insurance (FCI) program stabilizes the local farm economy and maintains agricultural productive capacity. Initially (1938), the Federal Crop Insurance Corporation (FCIC), which administers the program, protected only wheat producers against losses from adverse weather conditions, insects, plant diseases, and other unavoidable hazards. However, since 1938, other crops have been added on an experimental basis. Currently, about 25 major crops are covered by the program. Should the bills noted above be enacted, over time additional crops would be added as actuarial data become available and premiums established.

Federal crop insurance is based on the "all risk" principle. This guarantees a producer a certain amount of production in bushels, pounds, or other commodity units. If

the producer harvests less than his guaranteed amount because of unavoidable natural hazards covered by the insurance, he is paid for the shortage. The FCIC guarantee is based either on the production history and potential for the area in which the producer is located or the production records of the individual farmer for some commodities. FCIC never guarantees more than 75 percent of the average production for the area or the individual farmer, based on several years of production data. Thus, the producer bears crop losses until they reach 25 percent below normal production. Furthermore, the maximum coverage is limited so as not to exceed the producer's investment in the crop.

Producers who participate pay a premium set at a level anticipated by the FCIC to cover crop losses, and contribute to a reserve fund for unanticipated losses. Premiums vary according to the geographic area, between and within the crops, the insured level of production, and the specific price per unit of loss guaranteed by FCIC. Limits are imposed on the crop insurance coverage to maintain reasonable premiums. Not all crops or geographic areas are covered, particularly high-risk areas. In 1975, FCI was available in about half the counties in the United States.

Although designed to be actuarially sound, the FCI program is nonetheless subsidized by the Federal Government. Authority is granted to the FCIC to spend up to \$12 million from appropriations on operating expenses. Since this level of funding is inadequate to operate the program, an amendment to the Federal Crop Insurance Act in 1956 provided authority to use premium income for operating expenses. The operating expenses are not considered when premiums are calculated. Thus, any expenses in excess of the authorized \$12 million are charged against reserves. Furthermore, the FCIC does not have certain expenses, such as income taxes and capital costs, that a private insurance company would have if it were providing a crop insurance program. Thus, the FCIC is able to provide more assistance with the help of these subsidies, than private insurance alternatives at the same premium.

Despite these subsidies, participation in this voluntary program is low. Only about 13 percent of the eligible wheat, corn, barley, grain sorghum, soybean, and cotton acreage was insured in 1976, which is about 8 percent of the total planted acres for these crops. This low participation is partly due to the availability of low-interest loans, and partly to the existence of the disaster payments program, which, as noted above, is essentially a free insurance program. Legislation currently in the Congress would increase the availability of crop insurance, reduce its cost

to farmers through a subsidy, and restrict eligibility for other disaster assistance.

National Flood Insurance

The National Flood Insurance Program embodies six major congressional objectives:

- to help homeowners, businesses, and others;
- to complement existing Federal disaster relief programs;
- to eventually become a solely private venture;
- to encourage land use planning in flood-prone areas;
- to force flood disaster victims to pay a portion of their losses; and
- to reduce Federal expenditures for flood disaster relief.

The National Flood Insurance Act of 1968 required participating local jurisdictions to enact land use controls. However, this Act proved ineffective in reducing Federal flood disaster relief spending because participation in the program was voluntary and thus could not be enforced. Provisions of the 1973 Flood Disaster Protection Act made realization of the last three objectives listed above possible. However, actions taken since 1973 have made such realization less likely. An important section of the Act required beneficiaries to purchase flood insurance where it was available. The Congress legislated that no Federal financial assistance for purchase or construction in a flood plain area would be made available unless flood insurance was purchased. The Congress also prohibited, with certain exceptions, loans by federally regulated financial institutions. Insurance was not made available until the local government joined the program by adopting appropriate land use regulations. This requirement assured that flood disaster victims would help pay a portion of the cost of their losses, and that adequate flood plain land use controls would be adopted to limit future flood losses by restricting flood plain development. These provisions were relaxed in 1977 by the Housing and Community Development Act, P.L. 95-128. Thus, there is now, in theory, less incentive to join or remain in the program. However, since most lenders

will not make loans in hazard-prone areas, without insurance, communities are joining rather than leaving the program.

The present program is a public venture. The Federal Government estimates actuarial and subsidized policy rates, markets and services the policies, and collects the premiums.

The National Flood Insurance program provides subsidized insurance to participants under its emergency and regular programs. Under the emergency program, limited coverage is provided at subsidized rates to both existing property owners and for new construction, prior to the establishment of actuarial premiums. Once actuarial rates have been established and a rate map published, coverage may be increased. However, the increased coverage must be obtained by existing property owners at unsubsidized rates and new properties must pay full actuarial rates on the total amount of coverage obtained. Since, under the regular program, existing property is subsidized and new construction is not, apparently concern is not so much with property already in a flood plain but with future development there. 1/ Each policy has a deductible of \$200 which applies separately to personal property and to structures.

1/Within the National Flood Insurance program, there are programs that aim at relocating economic and social activity out of the flood plain (one by purchase of the property).

CHAPTER 3
CHOICES AMONG ALTERNATIVE
FORMS OF ASSISTANCE

This chapter addresses the common and unique problems associated with the three primary forms of assistance, loans, grants, and insurance, discusses the objectives that disaster assistance policy should aim to achieve, and concludes with a discussion of the preferred form of assistance.

Natural disasters are random events. It is inevitable that they will strike some segment of the population, that some victims will not be able to finance losses from personal resources, that private insurers will not always be able to insure against such losses, and that some victims will be financially crippled. The possibility of such events occurring is the rationale for a Federal role in providing disaster relief and rehabilitation.

AID VS. NO AID: A
TRADE-OFF OF POLICY

A person decides to live or do business in a particular area based on the economic and social benefits and costs of living in that area. Such an action is called a locational decision. If the potential benefits of a particular area include some form of Federal disaster assistance, then it is more likely that a person will locate in that area than he would otherwise. This is not to say that an individual who suffers losses from a natural disaster necessarily made a bad locational decision, or did so because of existing Federal aid. However, if no Federal aid were available, a person might think twice about moving into a hazard-prone area. ^{1/} Thus, a policy trade-off problem exists: no Federal aid for disaster victims would be too callous, but if the anticipated availability of Federal aid induces (more) individuals to locate social or economic activities in hazard-prone areas, then the total annual economic costs of lost production, income, and wealth would be higher with a relief

^{1/}Logically, people are more likely to avoid a hazard if they know they must bear the full cost of that hazard. It is not clear, however, what proportion of people assess carefully the hazards associated with a particular location or the extent to which their decisions are influenced by such an assessment. For example, low income families cannot be as selective in choosing an area to live in as high income families.

program than without one. Thus, revenues that could be used for other purposes are instead channelled into rehabilitating an area struck by a disaster.

Ideally, Federal disaster relief programs should discourage poor locational decisions and encourage wise ones. Unfortunately, in reality individuals do not always make informed locational decisions and society has been unwilling to see them bear the full consequences of their mistakes. Even so, locational decisions should not be based on whether or not Federal aid is available. For example, the possibility should not exist for a farmer to farm marginally productive land knowing that if or when his crop fails, Federal aid will prevent him from being crippled financially.

People tend to make poor locational decisions for two reasons. First, because natural disasters are random events, people cannot be sure that they are moving into a disaster-free area. Second, people tend to ignore events whose probability of occurrence is very low, as is the case with severe disasters. ^{1/} Since people greatly underestimate total expected costs of loss due to natural disasters, actual total costs are always greater than expected. Thus, taxpayers end up paying more taxes to alleviate the greater financial burden placed on the Federal Government. These reasons for making a poor locational choice results in a problem of efficiency. The greater the degree of Federal subsidization of disaster losses, the less the incentive for individuals to make good locational decisions or, alternatively, to take appropriate precautionary action to minimize damage from natural disasters.

Another side of the policy trade-off problem involves questions of equity. Equity dictates that likes be treated alike (horizontal equity). Furthermore, disaster victims should bear their fair share of disaster losses with disaster victims "most in need" (that is, those victims suffering the greatest proportional losses and those victims suffering the greatest losses relative to their ability to recover from the loss) receiving the most assistance. But no single analytically appropriate formula exists for determining the fair share of disaster losses for society and disaster victims. Determining a fair share is purely a value judgment. We reemphasize that we take no position on the appropriate level of assistance.

^{1/}Howard Kunreuther et al., Disaster Insurance Protection Public Policy Lessons, John Wiley and Sons, Inc., 1973, pp. 165-186.

It is easy to see how equity considerations can result in a failure to achieve the most efficient locational solution because those living in the most hazard-prone areas will (by our equity criteria) recover the most assistance and thus there is a perpetuation of inefficient locational decisions at the expense of equity considerations.

Current policy provides disaster relief through three forms of assistance: loans, insurance, and grants. Though not specifically designed as such, the Federal tax system also provides disaster assistance and may be considered a fourth form of assistance. Differences between loans and insurance both inherently and in practice have very important implications for the fulfillment of efficiency and equity principles.

EFFICIENCY

For our purposes, efficiency is minimizing incentives for using a hazard-prone area. The three generic forms of assistance differ in the way they affect one's locational decision. These differences in the degree of risk-sharing arise from differences in the timing of victims' participation in the form of assistance. Any desired degree of risk-sharing can be attained under all three forms.

Suppose that an individual considering a move to a hazard-prone area has the option of choosing only one of the three forms of assistance. Suppose further that the contractual risk-sharing terms of each form are the same, say 50 percent. Under a grant program, the individual would receive 50 percent of the value of his loss from the Government when a disaster strikes, having to cover the rest himself. Under a loan program, he would receive a loan from the Government for the entire value of his losses, but pay back only half the loan. With insurance, the individual would receive a payment to cover his entire loss, 50 percent of which would be composed of premium payments the individual has already paid, if the insurance policy is actuarially correct.

Howard Kunreuther's research indicates that individuals are reluctant to insure themselves against low probability-high loss events. ^{1/} For example, assume two situations: in the first, a 10 percent probability exists of a \$1,000 loss; in the second, a 1 percent probability exists of a \$10,000 loss. Kunreuther indicates that individuals

^{1/}Kunreuther, pp. 165-186.

will typically insure against the first event but not insure against the second event. Because the probability of a natural disaster occurring is so low, individuals tend to view insurance as a bad gamble. Thus, potential victims expect to bear a greater proportion of losses under insurance than under either loans or grants. This situation remains true even if the insurance premiums are actuarially correct and the actual degree of risk-sharing is the same under each form. With insurance, one must put out money "up front" that may or may not be cashed in. Such is not the case with loans and grants.

In our example, with a grant or a loan, the individual knows that he will have to finance 50 percent of his losses from his own funds. With insurance, however, he does not know how much he will have to finance. The percentage of the loss actually covered by the victim's own premium payments can only be determined after the loss occurs. Kunreuther would suggest that in our example this percentage is typically believed to be greater than 50 percent.

We believe that the timing of risk-sharing, when participation occurs, is important to the efficiency of disaster policy. In grant and loan programs, participation occurs after a disaster strikes, while with insurance, it occurs before the disaster. In fact, with insurance, participation occurs whether or not a disaster actually strikes. If the cost of insurance (against disaster) is considered in the benefit cost computation, an individual will make a better locational decision because the cost, typically overlooked or underestimated, of high loss-low probability events (disasters) manifests itself.

Therefore, insurance provides the greatest disincentive to poor locational choices provided (1) the insurance is compulsory and (2) the premiums are actuarially sound. Insurance also helps provide information about risks which may encourage more rational locational decisions. These considerations make insurance, in principle, the most efficient form of assistance.

EQUITY

All three forms of assistance can, ideally, achieve the same degree of equity, when equity is viewed as the distribution of disaster burdens between taxpayers and victims. In reality, differences exist. The three forms also differ in other aspects of equity: consistency across programs and over time, and in the extent of assistance across income classes.

Consistency means that victims of similar natural disasters experiencing similar losses be accorded the same benefits and bear a similar share of the costs. This definition suggests two principles. First, the severity of a natural disaster should be measured by the extent of individual losses, not by the scope of the disaster. Second, the generosity of Federal disaster relief should vary with the severity of the disaster losses, not with the terms under which the programs are subsidized.

The notion that the degree of assistance should not vary across income classes is straightforward. Clearly, inequities may arise if the "real level of assistance" varies across income classes, especially if the Government bears a higher proportion of the losses for higher income victims than for those with lower incomes. Since the definition of "real assistance level" used in this analysis includes tax transfers, some disaster assistance programs provide the well-to-do with relatively greater loss and interest write-offs than the less well-to-do. Whether this income tax "benefit" truly results in an inequity is arguable. Ignoring this, however, there is disproportionate risk-sharing among disaster victims because of the progressive nature of the income tax system. The tax transfers that do occur escape budget scrutiny.

Historical data do not indicate a high correlation between the dollar volume of disaster assistance in any particular year and the severity of damage inflicted on individual property owners. For example, the greatest relative catastrophe property losses (\$10.26 per \$1,000 of value) occurred in 1955--a year in which property losses totaled \$1.4 billion. In 1971 losses totaled \$1.2 billion, yet property damage was only \$1.61 per \$1,000 of value. In 1955, SBA and FmHA disaster loans covered only 7.2 percent of losses, while in 1971 lending activity covered 48 percent of losses. 1/

Major changes in disaster assistance loan policy have often occurred in the wake of widespread natural disasters, such as an earthquake or a hurricane. During these periods, loan assistance has been liberalized even though individual losses were less, in many cases, than those of an isolated disaster, like the victim of an isolated tornado. For these isolated cases, terms of disaster assistance are often less

1/Dan R. Anderson, "All Risk Rating with Catastrophe Insurance," Journal of Risk and Insurance, December 1976, pp. 631-632.

liberal or assistance is not available at all. Such ad hoc changes in assistance policy create inconsistencies and violate commonsense notions of equity.

EFFICIENCY AND EQUITY OF EACH FORM OF ASSISTANCE

Many characteristics of loans, grants, and insurance programs affect both the efficiency and equity of assistance actually provided.

Loans

In general, four factors affect the efficiency and equity of loan programs providing disaster relief: interest rate subsidies, ¹/ the maturity of a loan, principal forgiveness, and the income tax bracket of the loan recipient. A detailed analysis of how these factors affect risk-sharing burdens and a comparative analysis of burdens on loan program participants versus insurance program participants are contained in appendix I. The following discussion merely summarizes the results. Because nonreimbursed losses (i.e., those losses which are financed through borrowing) and interest payments can be deducted from a recipient's taxable income, the effective cost burdens differ among disaster victims. Because of the tax code, the Government bears a larger proportion of the losses of higher-income individuals. Thus, a loan program can be less efficient with higher income individuals since they have greater inducements to make poor locational decisions.

The interest subsidy received by a loan recipient depends on the interest rate charged relative to other possible rates and the recipient's tax bracket. If the interest rate on a disaster loan equals the commercial rate of interest, the amount of risk borne by the individual is inversely related to his average tax bracket, since losses and loan interest payments may be deducted from taxable income. If the interest rate charged on a disaster loan equals the Federal Government's cost of borrowing, the borrower receives an implicit subsidy at no cost to the Government (unless the borrower defaults) and enjoys a tax write-off of losses and interest payments. Loans made at rates of interest below

¹/In general, agencies have not had the authority to regulate the interest rates on their loan programs because the interest rates have been established by law.

Federal borrowing costs 1/ involve substantial interest subsidies and cost the Government roughly the difference between its borrowing cost and its lending rate.

Aside from the size of the interest subsidy, the percentage of disaster losses borne by the Federal Government under its loan programs depends upon the maturity of the loans. The main effect of short maturities is to increase the percentage of costs borne by disaster victims--the present values of interest subsidies and the tax write-off of interest expenses are reduced. For example, with a loan made at the Federal cost of borrowing, reducing the maturity from 20 to 7 years increases the proportion of total costs borne by a commercial disaster victim from 8.6 to 31.7 percent. For residential disaster victims, a shorter maturity of 7 years increases the percentage of total costs borne to 65.8 percent at the Federal cost of borrowing, from a figure of 51.2 percent for a 20-year loan. 2/ However, lowering maturities reduces the cash flow of the victims who are presumably less able to afford the loss of cash after the disaster.

Principal forgiveness (a form of a grant) is not currently a part of Federal disaster assistance policy. But the Disaster Payments Program under USDA, combined with SBA and FmHA loan programs, assures virtually the same results, because losses on specific crops can be reimbursed to the extent of 30 percent to 40 percent by grants from the Disaster Payments Program, and the remaining losses may be financed with loans under SBA and FmHA programs. In these situations, the Federal Government's participation in risk-sharing is very high, thereby encouraging poor locational decisions and farming practices.

The impact of the tax system on the share of costs borne by individuals is illustrated in table 1. These data are based on simulations run by Rettger and Boisvert 3/ from

1/See, for example, "Long-Term Cost Implications of Rural Electrification Administration Direct and Guaranteed Loan Programs," U.S. General Accounting Office, PAD-80-19, Dec. 31, 1979.

2/See appendix I.

3/Michael J. Rettger and Richard N. Boisvert, "Economics of Federal Flood Insurance and Loan Programs," Search, Vol. 9, No. 2, 1979 (Ithaca, New York: Cornell University), pp. 1-39.

Table 1

Tax Rate Effects on Disaster Losses Borne
by Victims under Difficult Rates of Interest a/

10% Interest Rate
No Federal Loan Program

Tax rate	Amount of damage	Cost of loan	Tax transfer	Total cost to participant	Expected value of loss		Percent of losses borne by disaster victims (loan program)
					Ins. b/	Loans c/	
48.0	12,711	12,711	10,266	2,445	58.47	52.81	19.2
23.6	11,934	11,934	4,739	7,195	28.64	29.50	60.3
21.1	8,120	8,120	2,883	5,237	19.48	21.47	64.5
14.5	2,080	2,080	507	1,573	5.00	6.45	75.6

Federal Cost of Borrowing
Assumed 7.625%

48.0	12,711	10,716	9,619	1,097	58.47	23.69	8.6
23.6	11,934	10,061	4,441	5,620	28.64	23.04	47.1
21.1	8,120	6,846	2,701	4,145	19.48	17.00	51.0
14.5	2,080	1,753	475	1,278	5.00	3.07	61.4

3% Interest Rate

23.6	11,934	6,829	3,402	3,427	28.64	14.05	28.7
21.1	8,120	4,646	2,070	2,576	19.48	10.56	31.7
14.5	2,080	1,190	364	826	5.00	1.98	39.7

5% (Other Than Residential)

48.0	12,711	8,683	8,306	377	30.51	8.14	3.0
------	--------	-------	-------	-----	-------	------	-----

a/Assumptions - All data are in present value terms. Borrowers opportunity cost of funds: 10 percent (for discounting). Loan maturity: 20 years.

b/The expected value of insurance equals the actual rate paid (\$.24/\$100) or (\$.46/\$100) times damage.

c/The expected value of a loss equals the ultimate cost of the loss times the actuarial probability of loss. Actuarial probability equals .0041 for residential property and .0216 for commercial property.

actual data from two flood-prone communities in New York State. Several points are noteworthy about the data. First, estimated damages are based on property values which are, in turn, based on income levels. Given income levels imply certain average tax rates. 1/ We are assuming that damage is 20 percent of property values in the case of residential property and is the average value of losses experienced over 30 years by nonresidential property owners. 2/

The most striking characteristic of these data is the effective burden of cost sharing imposed on the less well-to-do under the various programs. Clearly the proportion of losses borne by the Federal Government is directly related to a victim's income. This relationship violates one concept of equity--the degree of assistance should not vary across income classes.

The second most striking characteristic is that loan programs are generally more generous to victims than insurance programs. The probabilities of loss and the value of property exposed to loss are the same whether insurance or loans are used, but expected values of loss under the two types of programs differ. Interest subsidies, loan maturities, and the tax code result in present values of actual losses, which convert to expected values that differ from subsidized insurance premiums. For residential disaster victims, a subsidized insurance program is preferable to relying solely on commercial sources. For commercial establishments and others in tax brackets of 48 percent or more, insurance is not a bargain. Any loan program with interest rates of 7-5/8 percent or lower is preferred to a subsidized insurance program by both residential and commercial property owners.

In summary, loan programs, whether they are used to cover property or income losses, have, in practice, involved value judgments which have changed over time. Thus, similarly affected individuals are treated differently at different times. One result is that the increased generosity of SBA and FmHA loan programs usually associated with widespread disasters is not effective in adequately covering individual property losses that are the most severe, e.g., losses from an isolated tornado. Furthermore, inherent in the loan device is the impact of the tax code on noninsured

1/Ibid. See table C-1, p. 38. All assumptions we make are contained in appendix I.

2/See appendix I for a full discussion of analysis.

losses. This causes the effective cost burden of the rich to be less than that of the poor, which seemingly contradicts broad Federal income redistribution goals and provides greater incentives for poor locational decisions by both rich and poor than does insurance.

Grants

Grants completely transfer covered risks to society but, if they do not cover total losses, they differ little from insurance in the benefits conferred, except that they cost the program participant nothing. That such grants are free to recipients makes these programs highly inefficient. Inefficiency is reduced by partial coverage of losses. However, the tax deductibility of nonreimbursed losses leads to the same inequities that exist under loan and insurance programs. The trade-off between inefficiency and inequity is quite clear with such grant programs, since one cannot be reduced without increasing the other.

Insurance

Two problems associated with disaster insurance reduce its efficacy--moral hazard and adverse selection. Adverse selection is unique to insurance but moral hazard is not.

Moral hazard refers to the fact that people can control an insured event's outcome to some extent, altering the probability and magnitude of loss. Having an insurance policy may create incentives for poor judgment and therefore change the probabilities upon which the insurance company has relied on to establish its rates. Thus, a fire insurance policy for more than the value of the premises might be an inducement to arson or at least to carelessness.

The problem with insurance is that property owners have been able to obtain damage assistance which provides nearly complete or complete protection at a cost which is lower than an alternative measure, such as prevention. In the case of flooding, for example, the best alternative measure may be to locate outside the flood plain. However, if insurance is very inexpensive or loans are heavily subsidized, a flood plain location may be economically more favorable. An individual who develops in a flood plain without mitigating the hazard, just because cheap insurance is available, not only increases the amount of property exposed to risk; such a move also changes the actuarial basis for the original rates.

Moral hazard also occurs when an insured event's outcome is partially dependent on management control. 1/ The prevented plantings benefit of the Disaster Payments Program opens the possibility for management to influence outcomes against which, in this case, free insurance is written. Farmers can choose not to plant and hope to be compensated. 2/

Moral hazards can be overcome through partial indemnification or through deductibles. Whatever portion of deductible losses is made whole again out of personal resources is an additional cost of risk exposure and may cause individuals to take measures such as locating outside of flood plains or deciding to plant crops. Moral hazard can be reduced or eliminated if the deductible portion of the policy plus premiums make people act in a manner which does not increase the actuarial risks for which policies were originally written. Another way to reduce moral hazard is by establishing outright prohibitions on development in hazard-prone areas. 3/

Moral hazard epitomizes the inefficiency of all subsidized disaster assistance programs. In the absence of deductibles, partial indemnification, or prohibitions against certain locations, more individuals may be induced to locate in hazardous areas because they bear a lower proportion of the costs of their decisions. These decisions not only increase the amount of losses due to natural disasters, but also increase the costs of the program itself. Nevertheless, with deductibles or partial indemnification, any losses that remain unreimbursed are deductible from victims' taxable incomes. This tax rule leads to the variation in assistance across income classes, discussed earlier in connection with loan programs. The variation in assistance, however, is not as serious a problem in the case of insurance as it is with loans. This inequity is, under present tax laws, an unavoidable consequence of removing the inefficiency of moral hazard from insurance programs.

Adverse selection occurs when insurance premiums are based on average rates (because custom tailoring of premiums

1/Search, Vol. 9, No. 2 (1979), p. 12.

2/We cite another interesting example. Following severe disasters, individuals have moved old kitchen appliances into flooded basements. Because of total indemnification, new appliances were financed on very favorable terms under SBA loan programs.

3/This precaution was an important part of the National Flood Insurance Program.

is not possible) set to cover a fairly broad spectrum of risks. Some individuals correctly will perceive that their risk is smaller than that implied by the premium. If these individuals choose not to insure, participation is lowered, more risky individuals remain in the program, and a self-reinforcing cycle of higher rates occurs because average risk increases. In theory, participation could eventually drop to zero.

Adverse selection does not create inefficiency or inequity. However, it is a problem since it can lower participation in insurance programs, and high participation is important to maximize benefits of risk-pooling, to spread the fixed costs of the program, and to reduce the pressure for other forms of post-disaster relief. The only solutions to this problem are subsidized rates and/or compulsory participation. Subsidization, however, may encourage poor locational decisions.

CRITERIA FOR DESIGNING A DISASTER ASSISTANCE PROGRAM

We suggest that the following criteria should be recognized in designing disaster assistance programs.

- The distribution of risk-sharing between the public and private sectors is a value judgment. Since the degree of risk-sharing defines the Federal role in providing relief, we take no position on how extensive that role should be. However, whatever the level of risk-sharing might be, assistance programs should be designed to minimize incentives for poor locational decisions.
- Likes should be treated alike within programs, across programs, and over time. This implies that the generosity of programs should depend on the severity of the disaster, with no variation in program terms; and severity should be measured on the basis of individual losses, not necessarily on the scope of the disaster. The design of programs must provide consistency and sensitivity to distributions of income and wealth among victims and between victims and taxpayers.
- No individual or group of individuals should be able to improve on their pre-disaster state as a result of disaster

assistance unless such an improvement reduces expected further losses. That is, if an individual moves from a hazard-prone area he has improved his circumstances but he has also reduced the potential for loss later. The opportunity to improve one's position without such a requirement may alter the behavior of individuals and also change the entire risk structure underlying the assistance program.

MEETING THE CRITERIA

We believe that insurance coupled with preventive measures is the best means of meeting these criteria suggested for designing a better Federal disaster assistance policy. Insurance has several advantages over loans and grants.

First, since insurance rates are based on actuarial data, an insurance system forces those providing the insurance to anticipate catastrophic events, thus providing for more stable funding of disaster losses. Furthermore, understanding the risks associated with catastrophic phenomena should enable program designers to suggest preventive measures that reduce the amount of property damage at given levels of risk and thereby lower insurance rates. In addition, it is hard to decide on the proper amount of risk-sharing without knowing what the total risks are and why they exist. If we know why certain risks exist, e.g., location of populations too close to the most hazardous portions of flood plains, poor building practices, poor farming practices, use of nonarable land for crop production, insurance is a good means of helping eliminate such circumstances or practices. This may be done either through outright prohibitions on location choices or a deductible provision in the plan which eliminates moral hazard. Such action is not possible with loans because they are made retrospectively. It follows that subsidized loans finance losses that could have been prevented through prohibitions or standards designed to reduce risk exposure, and those losses should not be borne by the Federal Government. 1/

1/ Loan programs could be designed that require the mitigation of losses in the same way as insurance. However, such a design does little for the current risks or make individuals aware of the their social and economic activity location.

Second, with insurance there need be only one value judgment--the level of subsidization of the insurance premium. The history of disaster assistance policy clearly demonstrates the problems that multiple and conflicting value judgments pose for the propriety of risks assumed by the Federal Government. Once actuarial rates have been established for disaster insurance (and we do not imply that this can be done easily) and a level of subsidization established, it is unlikely that these rates and levels will be changed. For example, with loans, increasing generosity of terms usually accompanies major natural disasters. The historical data on property damage due to natural disasters indicates that such changes are not strongly related to the actual severity of losses but instead to the overall amount of loss, which in turn bears little relation to the relative amount of personal suffering. It follows from this that some losses were inappropriately borne by the Federal Government. With insurance, increasing subsidy levels in the wake of natural disasters would have no effect (except affecting future disaster victims) because victims are already covered for loss. Changing premiums would not change the burden of loss on the victims or on the Federal Government.

Third, and perhaps most notable, the hidden subsidy that accompanies disaster loans in the form of tax transfers may result in improper distribution of the costs of natural disasters. Because of the progressive nature of the tax system, similarly situated victims of natural disasters are treated differently, with higher-income individuals bearing a smaller proportion of disaster losses than lower-income individuals. If insurance carried a constant proportion subsidy, all victims would bear the same risk. However, some would clearly pay more in premiums, depending on coverage levels desired and the actuarial risk of loss. If a heavier subsidy were desired for low-income individuals, tiered premiums or tiered coverage levels could accomplish this. For example, in the case of National Flood Insurance, the level of subsidization appears to be much higher for low-income individuals. On the first \$35,000 of coverage, participants pay only 10 percent of actuarial premiums; but on the second \$35,000 full actuarial rates are paid. Thus, individuals purchasing \$35,000 or less of coverage, presumed to be low-income individuals, receive a subsidy equal to 90 percent of their risk exposure. Those desiring coverage of \$70,000 receive a subsidy equal to about 45 percent of their risk exposure. With loans, the amount of risk exposure subsidized is reversed: those with higher incomes are more heavily subsidized and a large portion of the subsidy is hidden.

Mainly because of peculiarities in individual perceptions of risk exposure from low probability-high loss events,

insurance appears to provide the greatest disincentive to poor land use decisions. Thus, insurance is the most efficient means of providing assistance, even if the degree of risk-sharing between the Federal Government and victims were the same under loans and partial indemnification grants. Also, insurance programs are inherently more consistent over time than loans whose availability is triggered by and whose terms are the result of political decisions. Thus, the principles that should guide the formulation of disaster assistance policy indicate that both in theory and in practice, insurance is a far more appropriate mechanism than loans or grants because insurance is inherently more efficient and consistent in its terms. In practice, insurance produces far less distortion in income and wealth distribution among victims and between victims and taxpayers.

CHAPTER 4

SPECIFIC ISSUES REGARDING PROGRAM CHANGES

We were asked to respond to questions regarding changes in Federal disaster loan programs. We preface our answers by noting that, if and when a nation-wide program of all-perils insurance is available for both property and crop losses, there will be no need to raise these kinds of questions. However, in the interim, loan programs will be important until sufficient actuarial data has been accumulated to formulate sound insurance programs.

SHOULD ELIGIBILITY BE RESTRICTED TO INDIVIDUALS WHO CANNOT OBTAIN CREDIT FROM OTHER SOURCES?

Consider two individuals in the same income class, with the same amount of wealth and the same amount of property damage. One of the individuals has built up a savings account to act as self-insurance against virtually any contingency. This individual's foresight or rational anticipation of catastrophic events by having a savings account could well be penalized by a credit-elsewhere test. The savings could be used to secure a commercial loan at commercial rates of interest. The other individual, with no savings, may qualify for Federal assistance at lower interest rates and thus be rewarded for his failure to plan prudently.

The efficacy of the credit-elsewhere test in reducing the loss burden of those least able to afford a large financial responsibility is questionable because losses financed with loans may be written off Federal income taxes. Assume that individuals with high incomes cannot pass the credit-elsewhere test. ^{1/} They must rely on commercial sources for loans to recoup disaster losses. Low-income individuals, on the other hand, cannot obtain credit from commercial sources and so receive low-interest Federal loans. Our discussion in appendix I makes it very clear who bears a lower burden of loss in situations such as this. The individual passing the credit-elsewhere test and receiving, say, a 3 percent loan for 20 years bears nearly 40 percent of the disaster loss if he is in the 14 percent to 15 percent tax bracket. The wealthy individual

^{1/}"Farmers Home Administration and Small Business Administration National Disaster Loan Programs: Budget Implications and Beneficiaries," CED-79-111, U. S. General Accounting Office, August 6, 1979, makes it clear that this is not always true.

in a 48 percent tax bracket who must rely on commercial sources would bear only 19.2 percent of the total loss if he receives a loan of the same maturity at a 10 percent rate of interest. It is true that had the less well-to-do individual been forced to obtain credit from other sources, his burden of loss would have been much higher (76 percent using the assumptions spelled out above), but in the case of loans the tax code swamps the efficacy of the credit-elsewhere test as a means of transferring relative loss burdens between rich and poor.

If the wealthy individual obtained a Federal low-interest loan at, say, a 3 percent rate of interest, his loss burden would drop from around 19 percent to virtually zero. It seems unfair for those who are financially well off to receive such assistance at taxpayers' expense. But in fact, they do about as well without a low-interest loan.

The administrative feasibility of a credit-elsewhere test is questionable. Given the abuses of this test, it is worth considering whether it is practical to continue insisting on this test as a screening criterion for disaster assistance loans. In theory, there should be such a test in spite of its inadequacy as a means of conferring special benefits on low-income individuals relative to higher income persons or corporations. But if a properly administered requirement proves very costly, as it likely would, we question whether its use should be encouraged. Elimination of a credit-elsewhere test does not preclude the use of alternative screening criteria or alternative specification of a loan program that neutralizes the impact of the tax code on victims' share of losses.

We have concluded that normative principles and actual program experience argue strongly for insurance. Obviously, with insurance, the issue of a credit-elsewhere test does not arise. But loan programs must continue because full implementation of an all-risks property-and-crop-damage insurance program is years away. So perhaps a credit-elsewhere test would be useful even if poorly administered, because it presumably would screen out some loan applicants. However, a major problem with the continued use of the test is that, as mentioned already, it tends to penalize foresight and reward lack of it.

SHOULD FEDERAL LOANS FOR REPAIR
OR REPLACEMENT OF LUXURY
FACILITIES BE PROHIBITED?

The National Flood Insurance Program specifically excludes swimming pools from its coverage provisions. However,

other facilities such as gazebos and enclosed privately owned tennis courts are not excluded. We assume that from the perspective of those formulating the program, swimming pools simply represent a noninsurable risk, because those located on a federally-identified flood plain would be badly damaged by flood water.

We assume that this question is directed more toward wealth transfer considerations. That is, individuals owning swimming pools are presumably sufficiently wealthy to be in a better position to recoup losses. Given some constraint on the amount of disaster assistance funds, allocations should first be made to dwellings or businesses and last to luxury items. But, in fact, assuming a positive correlation between ownership of swimming pools and income level, the Federal tax transfers for disaster-related losses pay a large portion of damage to luxury items anyway. The Federal disaster assistance budget is considerably larger than implied by the disaster assistance outlays in the major programs. Including disaster-loss tax expenditures makes this budget unconstrained. Though devices such as credit-elsewhere tests and exclusion of swimming pools serve in some sense to allocate limited agency budgets to those in need, the tax transfer portion of the disaster budget achieves entirely different results.

This leaves us in a perplexing situation. If swimming pools were covered by insurance, then those willing to purchase coverage would do so while those choosing not to would write losses off their Federal income taxes. An individual in a 50 percent tax bracket would be better off with no insurance than with insurance whose premium level was 50 percent subsidized.

SHOULD LOANS FOR DAMAGE TO HOMES
AND PERSONAL PROPERTY BE TARGETED
FOR LOW-INCOME INDIVIDUALS?

Assuming some sort of constraint on disaster assistance funds, loans should go to those most in need of assistance. ^{1/} For the most part, these will be low-income individuals. But the problem with loan activity, as we have mentioned, is that the greater the extent to which loans are subsidized, the greater will be the tendency for individuals to make locational decisions without regard to hazard potential. This problem is compounded when income differences among natural disaster

^{1/}In theory, a limit exists on the amount of funds that the Government is willing to spend on disaster assistance.

victims are taken into account. Low-income individuals tend to locate their social or economic activity on the least expensive property, and such property is often the most hazard-prone.

Thus, targeting subsidized loans for low income individuals will tend to perpetuate poor locational decisions unless some strings are attached. It would be callous to refuse to provide assistance, but perpetuation of poor land use has large costs. To overcome this problem, the use of rehabilitation loans could be tied to relocation or, as a second best alternative, the purchase of insurance as a means of self-protection.

WHAT RATES OF INTEREST SHOULD BE CHARGED ON DISASTER LOANS?

The rate of interest charged on a disaster loan should depend on the level of risk the Federal Government is willing to bear, which depends on interest rates as well as the maturity of the loan and the tax status of the recipient population. For example, we show in appendix I that a loan made to a corporation at the Government's cost of borrowing involves considerable risk assumption for the Government. In fact, the loan involves considerably more risk assumption than would occur when, say, a 3 percent loan is made to a low-income individual. Thus, the tax transfers that occur with loans are large enough to conceal differences in interest rates.

One should understand the implications of the tax code and loan terms for levels of risk-sharing. To fully understand their consequences, the alternative of an insurance program needs to be compared with loans. See our discussion in appendix I, where we present estimated levels of risk-sharing under three Federal policy responses.

--The first provides insurance on a subsidized basis to individuals living in hazard-prone areas.

--The second makes loans available at subsidized interest rates to disaster victims living in hazard-prone areas after the event on which insurance is available has occurred. 1/

1/We made the assumption that insurance is available so that the probabilities of loss are the same for comparative purposes.

--The third is no Federal assistance.
Disaster victims must recoup losses
on an unsubsidized basis to the best
of their ability.

We show that 20-year loans made to residential property owners at the Government's cost of borrowing involve roughly a 50/50 risk-sharing arrangement, assuming an average tax bracket of 21 percent. Heavily subsidized 3 percent rates of interest on 20-year loans mean that victims bear slightly less than one-third of disaster losses. The same maturity loans to corporations, commercial establishments, and individuals in the 48 percent tax bracket, at the Government's cost of borrowing, mean that only 8.6 percent of disaster losses are actually borne by the private sector. Loans subsidized at 5 percent rates of interest to those with a 48 percent tax bracket shifts all but 3 percent of the total costs of natural disasters to the Federal Government. Shortened maturities such as 7 and 12 years increase the level of risk borne by disaster victims if all other factors are the same.

Loan programs and discussions of appropriate interest rates really cloud the issue of the appropriate amount of risk-sharing between the public and private sectors. Interest rates are only one part of the answer.

A key to disaster assistance policy is establishing what the appropriate level of risk-sharing is and whether that level should vary inversely with income. With insurance programs, the subsidy on actuarially sound programs establishes, without complication, the risk-sharing arrangement. With loans, this is clearly not the case. The National Flood Insurance Program subsidized its regular program by over 60 percent during the period 1969 to 1979. This subsidy describes the risk-sharing arrangement between the public and private sectors. If policymakers decide that a 60/40 risk-sharing arrangement is desirable under a loan program, then interest rates would have to be set on a case-by-case basis and depend on the maturity of the loan (which may be important from a debt servicing burden perspective) and the tax brackets of victims.

One of the more interesting results that would emerge from this change in policy perspective is that for those in higher tax brackets, Federal loan assistance terms would be less advantageous than those available in commercial lending markets (assuming a 60/40 risk sharing arrangement is desired). For example, a loan made at commercial rates to those in a 48 percent tax bracket involves an immediate tax loss write-off of 48 percent of the loss and additional write-offs of interest expense. The combined effect of these tax transfers

implies that disaster victims in this tax bracket bear less than 20 percent of losses when relying on commercial sources of financing. Any Federal effort to impose a 60/40 risk sharing arrangement on such individuals would make them worse off than with no Federal help.

HOW CAN THE FEDERAL GOVERNMENT AVOID
ASSUMING RISKS THAT SHOULD PROPERLY
BE BORNE BY PRIVATE INDIVIDUALS AND
FIRMS?

This is a long-term problem with a long-term solution. The solution's components include insurance (which implies knowledge of the actual risk exposure from natural hazards) and land use controls. Loans are not part of the solution except as an interim measure.

The question presumes that there is a proper role or appropriate level of risk to be borne by the Government and that there are now risks borne by the Government that should be borne instead by affected individuals and firms. We reemphasize that we have no analytical solution to the appropriate level of risk that should be borne by the Federal Government. We do believe, however, that there are risks currently borne by the Government that should not be borne, on behalf of disaster victims.

Clearly, it should be a matter of public policy that individuals intentionally locating in hazard-prone areas have no moral claim on the general revenues of the Treasury. Yet, even here there are problems because both intentionally and unintentionally, the less well-to-do tend to locate in the most hazard-prone areas. Generally, Federal policy has been to assist those most in need following natural disasters. In this case, disaster assistance policy conflicts with the principles by which insurance companies avoid uninsurable risks.

The Federal Government bears risks and losses that are more appropriately borne in the private sector whenever losses caused by natural disasters could be prevented by individuals, whenever loans are viewed more favorably than insurance, and when the tax code compensates the well-to-do more than the less-well-to-do. Clearly, the Federal Government should not subsidize imprudent decisions. But in most cases the blame for such decisions is shared by the individuals and the Federal Government.

The most appropriate ways for the Government to avoid assuming risks that should be borne by private individuals and firms are as follows:

--deciding what level of risk-sharing is proper, and whether the level should vary in accordance with broad income distribution goals;

--attempting to find out what the actual risks are in various areas of the country, and using measures other than or in addition to, insurance where risks are clearly uninsurable; and

--treating likes alike and unlikes differently.

Insurance coupled with preventive measures apparently is the best means of arriving at a proper level of risk-sharing between the public and private sectors. Insurance commends itself by its very nature but also is clearly superior when compared to alternative means of delivering disaster relief.

Many imprudent decisions are made because complete information is not available or because people do not appear to behave rationally in protecting themselves against low probability-high loss events. Reasons for these decisions include limited knowledge about its cost or the hazard potential. According to Kunreuther, the two most significant factors influencing an individual to purchase insurance are whether the hazard is considered serious and whether one knows someone who has purchased coverage. 1/

Given the availability of low-interest loans and the workings of the tax code, we have seen that it is still to some people's advantage not to purchase insurance, no matter how well informed they are. As long as individuals believe that low-interest loans will be available, there is little incentive to consider the hazard potential they face, or to insure against it. Thus any insurance program must include as one of its stipulations that once insurance is available, alternative forms of disaster assistance will be no longer available.

The significance of the National Flood Insurance Program (NFIP) is important. Flooding and hurricane damage have, historically, accounted for over 80 percent of all property losses in the United States. When the NFIP was established in 1968, property insurance could be written for every major natural disaster except landslides. Thus, with full

1/Howard Kunreuther et al., *Disaster Insurance Protection: Public Policy Lessons*, p. 120.

implementation of the NFIP (which will take a long time), many of the property losses improperly borne by taxpayers should no longer be a problem. From a policy perspective, the NFIP has the potential to solve many of the problems associated with delivery of disaster assistance.

ARE THERE CIRCUMSTANCES UNDER WHICH OTHER METHODS OF DEALING WITH AGRICULTURAL DISASTERS WOULD BE PREFERABLE TO CURRENT DISASTER LOAN PROGRAMS?

Under all circumstances, assistance for agricultural disasters would best be provided by all-perils, nationwide crop insurance. Coverage of crops is very low under the current Federal Crop Insurance Program; by far the majority of disaster-related crop losses in the United States are covered by disaster payments grants 1/ and subsidized loan programs. Insurance is the preferred form of assistance because of its superior efficiency and equity, as was explained in chapter 3.

Voluntary partial indemnification crop insurance is available in about 50 percent of U.S. counties on about 25 crops. The crop insurance program is not meant to be an income stabilization program but is designed to indemnify farmers against extraordinary losses that cannot be anticipated, planned for, and financed out of personal resources. For example, the current FCIP would provide a farmer who normally produced \$20 worth of a product that was totally destroyed only 75 percent of the costs that he had incurred up to the point at which it was destroyed. 2/

Currently, agricultural production losses are covered by five programs, each with a different level of subsidy. Some programs are more heavily subsidized than others and those are obviously preferred by victims. Crop insurance is the least heavily subsidized, yet the benefits of high rates of participation argue for sufficiently high subsidy levels on insurance so that insurance is preferred to alternative forms of assistance. The issue is really how best to deliver the subsidy/grant element in Federal disaster assistance to victims.

1/As noted on page 9, this situation may change after the 1981 crop year with the cancellation of the disaster assistance payments program and an expanded and enhanced insurance program.

2/Under the proposed laws, under these circumstances the farmer could receive \$15 or 75 percent of his income loss.

We believe that insurance is the most efficient and equitable means of doing this.

Tremendous program overlap exists among loans, insurance, and disaster payments for crop losses. For growers of major crops, indemnities for crop losses may be received from both FCIC and the Disaster Assistance Payments Program. This overlap does not suggest that insurance is the best means of delivering the subsidy; however, it does suggest that delivery of the subsidy should be made through one mechanism.

The most significant programs having an impact on participation in the crop insurance program are Disaster Assistance Payments and SBA loans. In 1974 and 1975, an average of \$278 million in disaster payments was made to farmers in Federal Crop Insurance Corporation counties. Certain of these payments were made to farmers who were too high-risk to participate in the insurance program but not all payments were made to uninsurable farmers.

Problems with agricultural disaster loan programs have been studied by us. ^{1/} In 1976 and 1977, severe and widespread drought affected a large part of the United States. During fiscal year 1978, loans to farmers were \$5.2 billion, nearly 90 percent of all SBA and FmHA disaster loan activity. Our report pointed out inconsistencies in program provisions and an inability to administer the loan programs adequately. Furthermore, because of the low interest rates on loans made during this period, apparently many farmers who were clearly well off, took advantage of Federal loans. For example,

"A corporation that was not primarily engaged in farming obtained an FmHA disaster assistance farm loan of \$90,000 for 7 years. In fact, the business of farming was not mentioned in the corporation's charter. The four owners of the corporation have a combined net worth of about \$3 million. In addition to the individuals' interest in the corporation, real estate, and other long-term assets, they had cash on hand and marketable

1/Farmer's Home Administration and Small Business Administration Natural Disaster Loan Programs: Budget Implications and Beneficiaries, CED-79-111, U.S. General Accounting Office, August 6, 1979.

stocks of more than \$3.7 million. Their assets included a substantial ownership in two rural banks. * * *"^{1/}

The interest subsidy to this borrower, assuming a 10 percent commercial rate of interest, amounts to nearly \$20,000, making the actual cost of the loan about \$70,000. But the tax write-off of the disaster loss and interest payments amounts to \$46,000. Thus, the effective cost of the loss to the "victim" amounts to around \$24,000 or 25 percent of the total loss. No wonder individuals with presumably high tax brackets choose to take advantage of low interest loans. Clearly, no actuarially sound crop insurance program whose premiums were less than 75 percent subsidized would appear attractive to wealthy farmers. The above loan cost taxpayers \$61,300 and clearly was not directed at those truly in need.

For loan programs, it may be feasible to design highly selective criteria for screening applicants. We would assume that such criteria would have to be more selective than a credit-elsewhere test. Administration is another concern. Clearly, since Federal money is being loaned at substantial costs to the Government and hence, to taxpayers, it is the Government's prerogative to specify who should and should not receive these loans. Also, current program administration is directing loans not only to those who would face financial ruin otherwise, but to others as well.

While it is true that the administration and coordination of existing loan programs must be improved to avoid abuse, a redesigned disaster assistance policy must, to the maximum extent possible, eliminate value judgments and at the same time remain equitable. We believe that such a redesigned policy implies a deemphasis of loans as a means of delivering the subsidy and an emphasis on insurance. Not only are decisions regarding income groups receiving assistance political or value judgments, so also are the declarations of disasters by the President or executive agencies, who in turn trigger loan programs.

The availability of grants and loans to cover crop losses must be terminated to make insurance an effective form of assistance. Participation in an insurance program will continue to be low as long as these alternatives exist, since they are less expensive to disaster victims for the benefits received. In addition, eliminating grant and loan

^{1/}Ibid., p. 68.

programs will make funds available to subsidize insurance, which will further increase participation in the program.

However, alternatives to insurance cannot be eliminated instantaneously with inauguration of expanded crop insurance programs. Aside from disaster payment crops, which can be covered virtually immediately, other crops must be phased into an insurance program. Logically, we would envision coverage under alternative loan programs being phased out as crops become covered under insurance. However, care must be taken to assure that the terms of loan programs for non-insured crops never make them more favorable than insurance coverage, ideally for all farmers.

Some form of subsidy would be needed under a crop insurance program. Without a subsidy, participation will be too low to make the program effective. However, subsidies create a familiar dilemma for a crop insurance program. If subsidies target on the most risky farmers, poor farming practices or bad locational decisions will be perpetuated. The most risky farmers may have the most bona fide need but also they may have the least justifiable claim on taxpayers' money. Furthermore, less risky farmers in less hazard-prone locations will not be as likely to participate in the program because subsidies to them may not be sufficient to warrant the investment.

If subsidies were to be targeted on the most risky farmers, it could be done with a program design similar to the National Flood Insurance Program, wherein a fixed premium is charged under the emergency program regardless of actuarial risk, and actuarial rates are paid under the regular program. Subsidies would vary directly with risk. Agricultural crop insurance would be more complicated than flood insurance. Only two or three variations exist in flood insurance contracts, while there must be many crop insurance programs to cover the many different losses involving crop and income.

An alternative program design would provide the same degree of subsidy to all farmers. While this approach does not target subsidies at those most in need, it reduces incentives for poor locational decisions. Furthermore, this approach would maximize program participation since larger subsidies would be provided to less risky farmers. Also, problems of adverse selection and its impact on the quantity of participation would be reduced.

The equity and efficiency trade-offs involved in allocating insurance subsidies are unavoidable. Probably the best solution is to allow for some targeting of subsidies

toward riskier farmers 1/ only if they are relatively poor. Whatever subsidy scheme is adopted, however, insurance remains the preferred form of assistance in all circumstances. The incentives for efficient locational decisions created by insurance benefit both farmers and the Government because disaster losses are reduced, as are the assistance payments needed to cover these losses. For an insurance program to be effective, however, it is imperative that other forms of assistance (i.e., direct payments and loans) be eliminated.

1/A farmer who is risky is marginally productive, or farms in a hazard-prone area.

CHAPTER 5

CONCLUSIONS AND AGENCY COMMENTS

Ideally, the Federal role in providing financial assistance to disaster victims should be defined by determining the Government's appropriate level of risk-sharing on behalf of the public. We take no position on what an acceptable level of risk should be, because that level of risk-sharing is not determined objectively. Currently, the level of risk-sharing is a subjective, political decision based on value judgments.

Economic welfare concepts of efficiency and equity must be incorporated into designing Federal disaster programs. With certain exceptions, current programs do not adequately embrace these principles, because they do not:

- minimize the possibility of Federal policy contributing to bad locational decisions;
- provide consistent benefits among disasters, victims, or over time; or
- provide a "controllable" disaster assistance budget.

We believe that Federal disaster policy should meet the following goals:

- Treat likes alike (horizontal equity).
- Provide assistance to those most in need, given a disaster budget constraint.
- Discourage location of economic and social activity in hazard-prone areas, or, encourage relocation and private hazard mitigation.
- Protect individuals, businessmen, farms, etc., from financial bankruptcy.
- Improve the cost effectiveness of disaster assistance.

Any desired degree of equity and risk-sharing can be attained under the generic forms of assistance. However, of the forms available to disaster victims--loans, grants, and insurance--insurance, coupled with preventive measures, apparently is the best means of attaining the proper level of

risk-sharing between the public and private sectors. Insurance is superior to alternative means of delivering disaster assistance, as indicated below.

INSURANCE IS PREFERRED
BY THE FEDERAL GOVERNMENT

Insurance has at least four advantages over other forms of assistance as to the goals of a well designed disaster policy. Since insurance rates are based on actuarial data and anticipate catastrophic losses, insurance provides more stability in funding disaster losses, because losses are paid from reserves accumulated before the fact. Understanding the risks associated with catastrophic phenomena should enable program designers to suggest preventive measures to reduce the amount of damage at given levels of risk, and to identify hazard-prone areas where risks are so great that location of social and economic activity should be discouraged. In the long run, a better understanding of risk will help to lower program costs and insurance rates. In addition, deciding on the proper amount of risk-sharing is difficult without knowing what the total risks are and why they exist. If we know why certain risks exist, insurance is a good means of tying disaster assistance to eliminating such circumstances or practices. This is not possible with loans because they are made retrospectively.

Only one value judgment is needed with insurance--the level of subsidization of the insurance premium. The history of disaster assistance policy clearly demonstrates the problems that multiple and conflicting value judgments pose for the propriety of risks assumed by the Federal Government. Once actuarial rates have been established for disaster insurance (and we do not imply that this will be done easily) and a level of subsidization established, these factors are unlikely to change. With insurance, increasing subsidy levels in the wake of natural disasters (except as it affects future disaster victims) would do no good. The burden of loss on the victim or on the Federal Government would not change because insured victims have a claim for indemnification that should not be altered.

The cost of locating social and economic activity in a hazard-prone area is clear with an insurance program. Recognition of the cost may prevent future losses by forcing those contemplating using hazard-prone areas to assess the costs of doing so.

The hidden tax transfer subsidy associated with loan programs results in the Government's bearing varying shares

of the cost of natural disasters because the Government's share depends on individual income levels. The progressive nature of the tax system causes higher-income individuals to bear a smaller share of disaster losses than lower income ones. If insurance carried a constant proportional subsidy, all victims would bear the same relative proportion of total risk, though some would clearly pay more in premiums, depending on the coverage level desired and the actuarial risk of loss. If low-income individuals desired a heavier subsidy, tiered premiums or tiered coverage levels could be arranged.

AGENCY COMMENTS

By letter dated March 12, 1980, we requested written comments from the Small Business Administration, the Department of Agriculture, and the Federal Emergency Management Agency. Official agency comments from the Federal Emergency Management Agency are contained in appendix III. Because these comments did not arrive within the allotted 30-day period, they are included mainly for information. The Small Business Administration and the Department of Agriculture did not formally respond. We discussed the report with officials of each agency. Their comments were generally editorial or provided updated information, and the agencies expressed regret that the report did not provide more details on the programs discussed and that we did not report on other disaster assistance programs they administer. We incorporated the updated information into the report.

GENERIC FORMS OF ASSISTANCE:
TECHNICAL IMPLICATIONS

Three principal factors affect the extent to which individuals bear the costs of disaster losses when loans are made: the maturity of the loan, its interest rate, and the average tax bracket of loan recipients. In the case of insurance, the only factors affecting the amount of cost borne by individuals are the extent to which premiums are subsidized (assuming that actuarial rates are correctly set) and the size of the deductible. Grants completely transfer risks to society, but if they do not cover total losses they differ little from insurance in the benefits conferred except that the grants themselves are less costly to the victims than subsidized insurance.

The amount of risk-sharing is fairly straightforward with insurance but not with loans. The only element of explicit subsidy conferred in a loan program (versus no loan program) is the interest subsidy, assuming that the maturity structure of disaster loans is similar to that of commercial loans. But other factors affect the cost borne by disaster victims versus the taxpaying public. If the interest rate on a disaster loan equals the commercial rate of interest (in effect, equivalent to no loan program), the cost borne by the individual is reduced as his average tax bracket increases because losses and interest payments on loans may be deducted from taxable income. If the interest rate charged on a disaster loan is equal to the Federal Government's cost of borrowing, the individual receives an implicit subsidy at no cost to the Government (unless the borrower defaults) and enjoys a tax write-off of losses and interest payments. Loans made at rates of interest below Federal borrowing costs involve substantial interest subsidies and cost the Government at least the difference between its borrowing cost and its lending rate, as well as the tax transfers due to loss write-offs and interest. These considerations have very important implications for the amount of risk borne by individuals and the extent to which loans compare favorably or unfavorably with insurance.

If a borrower with a 10 percent opportunity cost of borrowing receives a loan with a 10 percent rate of interest, the cost of the loan is equal to the amount borrowed. Whenever the rate of interest charged on a disaster loan is lower than the borrower's opportunity cost of borrowing, the present value of a loan for the full amount of the loss is less than the value of the loss. The deeper the interest subsidy to the borrower, the lower the cost of the loan to the face amount of the loan. The present value of a loan is also affected by its maturity. The longer the maturity,

the lower the ratio of the present value of the loan to the value of losses. Combining these considerations with tax write-off ones, we find that a substantial share of the disaster victim's loss burden is removed when loans are made at the Federal cost of borrowing. Furthermore, depending on how much insurance premiums are subsidized, loan programs with minor or no direct subsidies can compare very favorably with insurance programs. Thus it is possible to design a loan program with no direct interest subsidy, and hence no direct interest cost to the Government, which is more attractive than a subsidized insurance program for the individual. In fact, we will demonstrate situations in which a loan program would be preferable by individuals to a subsidized insurance program.

A grant program like Disaster Assistance Payments is analogous to loan forgiveness provisions that have existed in the past to alleviate hardships. Principal forgiveness is not currently a part of Federal disaster assistance policy, but the Disaster Assistance Payments Program under the Department of Agriculture, combined with the existence of SBA and FmHA loan programs, assure virtually the same result. For example, losses on specific crops can be reimbursed to 30 to 40 percent by grants from the Disaster Assistance Payments Program and the remaining losses may be financed with loans under SBA and FmHA programs. In these situations, losses actually borne by farmers on crops will be very low compared to the total value of crop damage.

Comparison of the costs and benefits of insurance versus loans provides some interesting insights into the nature of these forms of assistance. Assume three different Federal policies:

- The first provides insurance on a subsidized basis.
- The second makes loans available at subsidized interest rates to disaster victims after the event on which the insurance is available has occurred. 1/
- The third is no Federal assistance. Disaster victims must recoup losses on an unsubsidized basis.

1/We made the assumption that insurance is available so that the probabilities of loss are the same for comparative purposes.

The specifications of each of these programs are contained in the list of assumptions accompanying table 2. The comparative data on benefits and costs and the assumptions made are in the following table for a community with total residential property exposed to loss of \$100 million and commercial property exposure of \$50 million. 1/ Actuarial rates are 41 cents per \$100 for residential property and \$2.16 per \$100 for commercial property. Deductibles on insurance are 4 percent of loss on structure and contents. We use two types of loan programs for comparative purposes: the first provides loans at the Government's cost of borrowing, assumed to be 7-5/8 percent; 2/ the second provides directly subsidized loans at 3 percent for residential property and 5 percent for all other property. It is also useful to compare benefits to disaster victims and costs to the Government if there were no disaster loans or insurance available. In the absence of these programs, losses and interest payments over the life of the loan would be deductible from Federal income tax liabilities.

The actuarial annual value of losses in our example is \$426,400 in residential property and \$1,123,200 in commercial property. 3/ Assuming 20-year commercial loans at 10 percent, the actual costs of the disaster in present value terms borne by victims are \$275,000 for residential property and \$216,076 for commercial property. Thus, tax transfers alone account for reductions in losses borne by disaster victims to 64.7 percent and 19.2 percent of total losses for residential and commercial property, respectively. We assume average tax brackets of 21 percent for residential property owners and 48 percent for commercial property owners.

1/This discussion is based on data contained in "Economics of Federal Flood Insurance and Loan Programs," Michael J. Rettger and Richard N. Boisvert, Search, Vol. 9, No. 2 (1979). Actuarial and subsidized insurance rates are based on their case study. Though actuarial rates are location specific, their level is not important when comparing loans made (based on expected losses) and insurance claims. Furthermore, though the comparison is for flood insurance, it is applicable to any other type of disaster insurance.

2/This figure obviously changes over time, but so also does borrowers' opportunity cost--expressed as the commercial rate of interest. The assumed Federal rate is not crucial in specifying the important relationship between loans and insurance.

3/The formulas used for our estimates of losses are in appendix III.

Table 2
Comparison of Costs and Benefits of
Insurance Versus Loans a/

	Victims					Percent of loss borne by victims	Government				
	Cost of insurance	Cost of loan	Tax reduction	Total costs	Total benefits		Premium subsidy	Loan subsidy	Tax reduction	Total costs	Total costs borne by victims and Government
Residential: \$426,400											
Insurance:											
Loans @ 7.625%	240,000	13,826	5,430	248,396	178,004	58.3	170,000	0	5,430	175,430	423,826
Loans @ 3.000%	240,000	9,384	4,161	245,223	188,177	57.5	170,000	5,268	4,161	179,429	424,652
Loans:											
@ 7.625%	0	359,485	141,188	218,297	208,103	51.2	0	0	141,188	141,188	359,485
@ 3.000%	0	244,005	108,202	135,803	290,597	31.8	0	136,974	108,202	245,176	380,979
No Program	0	426,400	150,662	275,738	150,662	64.7	0	0	150,662	150,062	426,400
Commercial: \$1,123,200											
Insurance:											
Loans @ 7.625%	230,000	36,673	32,922	233,751	889,449	20.8	850,000	0	32,922	882,922	1,116,673
Loans @ 5.000%	230,000	29,717	28,424	231,373	891,827	20.6	850,000	8,251	28,424	886,675	1,118,048
Loans:											
@ 7.625%	0	946,935	850,078	96,857	1,026,343	8.6	0	0	850,078	850,078	946,935
@ 5.000%	0	767,314	733,929	33,385	1,089,815	3.0	0	213,055	733,929	946,984	980,369
No Program	0	1,123,200	907,124	216,076	907,124	19.2	0	0	907,124	907,124	1,123,200

Table 2 (continued)a/Assumptions:

1. Coverages: residential \$100,000,000; commercial \$50,000,000
2. Paid-in premiums: residential \$0.24/\$100
commercial \$0.46/\$100
3. Actuarial rates: residential \$0.41/\$100
commercial \$2.16/\$100
4. Losses = Actuarial losses x \$1.04 (because of 4% deductible on structure and contents)
= \$426,400 residential
= \$1,123,200 commercial
5. Interest rate: two programs - Government cost = 7.625% and residential = 3%; commercial = 5%.
6. Borrowers opportunity cost of funds; 10% for discounting.
7. Average tax rates: residential 21%
commercial 50%
8. Loan maturity: 20 years.
9. All data in present value terms.

It can be argued that tax transfers will occur with or without a loan program and therefore consideration of such transfers is irrelevant to discussion of the costs and benefits of disaster loan programs. We would agree with this argument were it not for the following considerations:

- First, we question public awareness regarding the size of the risk transfer that is accomplished just through the workings of the tax system.
- Second, the analysis makes obvious the different impacts on percentage of losses borne that result from progressive taxation. Most notably, any interest subsidy short of an outright grant will not correct the fact that through the tax system, wealthy individuals bear a lower share of total losses and risks than the poor.
- Third, and most important, tax transfers have very important implications for the viability and design of disaster insurance programs. For example, the above indicates that roughly 80 percent of the actuarial premium on an insurance policy for commercial disaster losses would have to be subsidized by the Federal Government to make commercial establishments indifferent between insurance and no disaster relief programs at all. The same indifference would be achieved for residential property disaster losses with subsidization of at least 35 percent of insurance premiums.

Loans at subsidized rates are by far the most favorable for corporate and other borrowers in the 48 percent tax bracket when alternatives are compared. If disaster loans are made at the Federal Government's cost of borrowing, those paying corporate income tax rates bear only 8.6 percent of total losses as compared with 20.8 percent under an insurance program. There is no interest cost to the Federal Government, but the transfer of losses through taxes amounts to over 75 percent of total losses. At 5 percent rate of interest, disaster losses are virtually costless to those in the 48 percent tax bracket.

For residential disaster victims, insurance is better than no program at all, but not by a great deal. Residential

disaster victims bear roughly 60 percent of total losses. The reduction is primarily caused by the subsidized premiums on insurance. The 4 percent deductible does not result in uninsured losses large enough to obtain substantial interest subsidy or tax transfer benefits. Conversely, costs to the Government are higher for the insurance program than they are with no program at all. Loans provide the greatest benefits to residential disaster victims. Unsubsidized loans result in roughly a 50/50 risk-sharing between victims and taxpayers. Subsidized loans provide greater benefits in that only 31.8 percent of total losses are absorbed in the private sector.

The percentage of disaster losses borne by the Federal Government under its loan programs also depends on the maturity of the loans. Costs and benefits for alternative loan maturities of 7 and 12 years are presented in table 3.

Shorter maturities increase the percentage of costs borne by disaster victims because the value of interest subsidies and the tax write-off of interest expenses are reduced. Costs of the deductible insurance programs are not much affected by shorter maturity loans because loans on unreimbursed losses are small in relation to the total costs of natural disasters. Loans made at the Federal cost of borrowing with 7-year maturities to commercial disaster victims increase costs borne by them from 8.6 percent to 31.7 percent of total costs compared with 20-year maturities. The same figure for 12-year maturities is 21.8 percent of total costs. Shorter maturities also significantly affect comparison between insurance and loans for commercial disaster victims. Only directly subsidized loans at a 5 percent rate of interest with maturities of 12 years compare favorably with insurance costs.

For residential disaster victims, shorter maturities of 7 or 12 years increase the percentage of total costs borne to 65.8 percent and 59.3 percent at the Federal cost of borrowing. Only in situations where there is a deep interest subsidy do loans in this maturity range compare favorably with costs of insurance.

The maturity of loans and the tax brackets of targeted individuals are extremely important. For example, figure 1 shows that various combinations of tax rates, interest rates, and maturities produce a ratio of private to total costs of disaster losses of 30 percent. Altering the maturity of a 3 percent disaster loan from 7 to 20 years lowers the proportion of cost borne by individuals in the 21 percent tax bracket from roughly 60 to 40 percent. Furthermore, those in higher tax brackets bear much lower proportions of total costs.

Table 3

Comparison of Costs and Benefits of Insurance, Loans, and
No Federal Program, Assuming Different Loan Maturities

	<u>Participant cost of insurance</u>	<u>Cost of loan</u>	<u>Tax reduction</u>	<u>Total costs</u>	<u>Total benefits</u>	<u>Government premium subsidy</u>	<u>Loan subsidy</u>	<u>Tax production</u>	<u>Total costs</u>	<u>Total costs borne by victims and Government</u>	<u>Percent of loss borne by victims</u>
Residential:											
Insurance:											
Loans @ 7.625% (7)	240,000	15,139	4,348	250,791	175,609	170,000	0	4,348	174,348	425,139	58.9
Loans @ 7.625% (12)	240,000	14,541	4,819	249,722	176,678	170,000	0	4,819	174,819	424,541	58.6
Loans @ 3.000% (7)	240,000	12,815	3,786	249,029	177,371	170,000	2,517	3,786	173,786	422,815	58.4
Loans @ 3.000% (12)	240,000	11,226	3,953	247,273	179,127	170,000	3,738	3,953	173,953	421,226	58.0
Loans:											
@ 7.625% (7)	0	393,623	113,064	280,559	145,841	0	0	113,064	113,064	393,623	65.8
@ 7.625% (12)	0	378,069	125,295	252,744	173,656	0	0	125,295	125,295	378,039	59.3
@ 3.000% (7)	0	333,194	98,460	234,734	191,666	0	65,460	98,460	163,920	398,654	55.1
@ 3.000% (12)	0	291,878	102,785	189,093	237,307	0	97,209	102,785	199,994	398,087	44.3
No Program:											
(7)	0	424,600	119,385	305,215	121,185	0	0	119,385	119,385	424,600	71.6
(12)	0	424,600	133,408	291,192	135,208	0	0	133,408	133,408	424,600	68.6
Commercial:											
Insurance:											
Loans @ 7.625% (7)	230,000	39,879	26,183	243,696	879,504	850,000	0	26,183	876,183	1,119,879	21.7
Loans @ 7.625% (12)	230,000	38,303	29,015	239,288	883,912	850,000	0	29,015	879,015	1,118,303	21.3
Loans @ 5.000% (7)	230,000	36,346	24,235	242,111	881,089	850,000	3,827	24,235	874,235	1,116,346	21.6
Loans @ 5.000% (12)	230,000	33,210	25,988	237,222	885,978	850,000	5,744	25,988	875,988	1,113,210	21.1
Loans:											
@ 7.625% (7)	0	1,036,860	680,745	356,115	767,085	0	0	680,745	680,745	1,036,860	31.7
@ 7.625% (12)	0	995,890	751,395	244,495	878,705	0	0	751,395	751,395	995,890	21.8
@ 5.000% (7)	0	945,015	630,101	314,914	808,286	0	99,493	630,101	729,594	1,044,508	28.0
@ 5.000% (12)	0	863,468	675,084	187,784	935,416	0	149,349	675,684	825,033	1,012,817	16.7
No Program:											
(7)	0	1,123,200	716,639	406,561	716,639	0	0	716,639	716,639	1,123,200	36.2
(12)	0	1,123,200	803,234	319,966	803,234	0	0	803,234	803,234	1,123,200	28.5

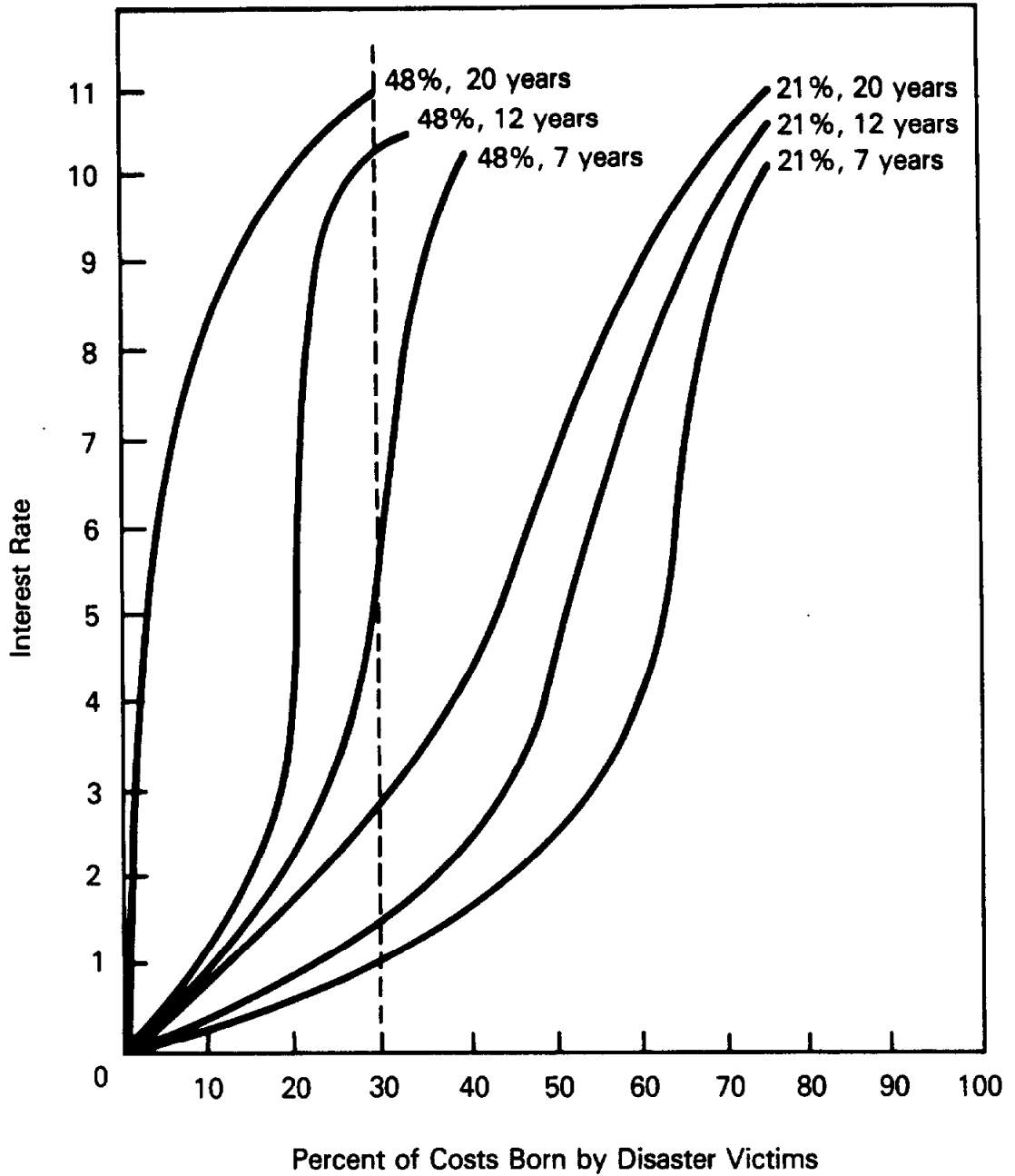


Figure 1

Percent of Disaster Losses Borne by Victims at Various Interest Rates, Tax Brackets, and Maturities

Moving from a 21 percent tax bracket to a 48 percent tax bracket for 20-year loans made at Federal borrowing costs reduces the share of costs borne by victims from about 51 percent to slightly over 21 percent.

Thus, the deeper the interest subsidy, the longer the loan maturity, and the higher the tax bracket, the greater the costs of natural disasters borne by the Federal Government, and the less favorably insurance programs compare with loan programs. The size of the interest subsidy is not the only determinant of the share of risks and costs borne by disaster victims and taxpayers.

The previous analysis discussed costs to an entire flood-prone community. The impact of the tax system on the share of costs borne by individuals is illustrated in table 4. There are several noteworthy points about these data. Estimated damages are based on property values which are, in turn, based on income levels. Given income levels imply certain average tax rates. We are assuming that damage is 20 percent of property value in the case of residential property, and the 30-year average value of losses experienced by nonresidential property owners as a percentage of total commercial property value.

Victims prefer insurance to loans only when loans are obtained at commercial rates of interest. Loans are preferred to insurance whenever they are made at or below Federal borrowing costs regardless of the tax status of victims. Among residential property owners, the less well-to-do bear 51.4 percent of disaster costs when loans are made at Federal borrowing costs, while those in the higher tax bracket (23.6 percent) bear 47 percent of costs. This seeming inequity in cost-sharing burden remains when loans are heavily subsidized. The depth of the subsidy cannot eliminate differences in risk-sharing due to progressive taxation. The 5 percent interest rate to nonresidential borrowers versus the 3 percent rate to residential victims does not offset the impact of the tax system on the share of costs borne. The inequities resulting from the tax system are reinforced by the fact that, in Rettger's and Boisvert's analysis, lower-income groups tended to constitute a higher proportion of flood plain residents than higher-income groups.

The most striking characteristic of these data is the burden of cost-sharing imposed on the less-well-to-do under programs compared with insurance. With insurance, a larger percentage of losses is reimbursed and thus, tax write-offs for unreimbursed losses are minimized. Clearly, if there is a desire to redistribute cost burdens in the direction of

Table 4

Tax Rate Effects on Disaster Losses Borne
by Victims under Difficult Rates of Interest a/

10% Interest Rate
No Federal Loan Program

Tax rate	Amount of damage	Cost of loan	Tax transfer	Total cost to participant	Expected value of loss		Percent of losses borne by disaster victims (loan program)
					Ins. b/	Loans c/	
48.0	12,711	12,711	10,266	2,445	58.47	52.81	19.2
23.6	11,934	11,934	4,739	7,195	28.64	29.50	60.3
21.1	8,120	8,120	2,883	5,237	19.48	21.47	64.5
14.5	2,080	2,080	507	1,573	5.00	6.45	75.6

Federal Cost of Borrowing
Assumed 7.625%

48.0	12,711	10,716	9,619	1,097	58.47	23.69	8.6
23.6	11,934	10,061	4,441	5,620	28.64	23.04	47.1
21.1	8,120	6,846	2,701	4,145	19.48	17.00	51.0
14.5	2,080	1,753	475	1,278	5.00	3.07	61.4

3% Interest Rate

23.6	11,934	6,829	3,402	3,427	28.64	14.05	28.7
21.1	8,120	4,646	2,070	2,576	19.48	10.56	31.7
14.5	2,080	1,190	364	826	5.00	1.98	39.7

5% (Other Than Residential)

48.0	12,711	8,683	8,306	377	30.51	8.14	3.0
------	--------	-------	-------	-----	-------	------	-----

a/Assumptions - All data are in present value terms. Borrowers opportunity cost of funds: 10 percent (for discounting). Loan maturity: 20 years.

b/The expected value of insurance equals the actual rate paid (\$.24/\$100) or (\$.46/\$100) times damage.

c/The expected value of a loss equals the ultimate cost of the loss times the actuarial probability of loss. Actuarial probability equals .0041 for residential property and .0216 for commercial property.

greater equalization across income classes or with more relief to the less-well-off, and if loan programs are to continue, either the structure of subsidies or the tax code must be changed. There is no assurance that targeting the deepest interest subsidies on low income groups will do anything more than provide for greater equalization of risk and cost burdens.

Unlike the property insurance example we have used, Federal crop insurance provides only partial indemnification of producer losses. Crop losses must be greater than 25 percent of normal production, and losses are reimbursed only to the extent of the difference between actual losses and the cutoff point of 25 percent. Actuarial premiums are unsubsidized, and only a portion of administrative expenses of the program are not reflected in premium levels. Thus, any loan program offering rates of interest below the farmer's opportunity cost of borrowing is more favorable from the perspective of the farmer. Furthermore, since crop insurance does not provide total protection, federally assisted loans may also be used to recoup losses, where it is to the farmer's advantage to do so.

In view of the relationships between costs of disaster losses and loans and insurance, a very heavily subsidized crop insurance program would be necessary to compare favorably with the current disaster loan programs of the Federal Government.

The existence of the Disaster Assistance Payments Program offers the victim an even more favorable alternative to loans or insurance on covered crops. Under this program, any farmer sustaining losses on selected crops may be reimbursed between 30 and 40 percent of total production losses at no cost. The remainder may, of course, be financed through use of low-interest loans. Such a program would not exist, however, with the implementation of a heavily subsidized insurance program.

FORMULAS

The total loan cost to the borrower is expressed as the value of repayment costs in the year the loan is granted:

$$C^* = LN \left[\frac{i}{1-(1+i)^{-N}} \right] \left[\sum_{K=1}^N \frac{1}{(1+r)^K} \right]$$

where: C^* = the value of repayment costs.

LN = the principal value of the loan.

i = the Federal lending rate.

N = the number of years to maturity.

r = the commercial borrowing rate.

The total subsidy may be calculated as the difference between the face amount of the loan and C^* . Not all of this subsidy is necessarily paid by the Government. For example, if the Federal lending rate (i) is equal to its borrowing rate (g), then there is no federally provided subsidy. Whenever (g) is greater than (i), then a Federal subsidy occurs and is calculated as follows:

$$S_g = LN \left\{ 1 - \left[\frac{1}{1+(1+i)^{-N}} \right] \left[\sum_{K=1}^N \frac{1}{(1+g)^K} \right] \right\}$$

where: S_g = the Federal interest subsidy.

g = the Federal borrowing rate.

The tax transfer component of the total subsidy has two parts: the immediate loss write-off:

$$S_{CL} = (LN)(t)$$

where: S_{CL} = the immediate loss write-off,

(t) = the effective tax rate,

and, the present value of tax deductible interest expenses:

$$S_{IP} = (LN)(t)(i) \sum_{K=1}^N \left[\frac{1-(1+i)^{-N+K-1}}{1-(1+i)^{-N}} \right] \left[\frac{1}{(1+g)^K} \right]$$

where: S_{IP} = the present value of the tax reduction for loan interest payments.

Thus, the total tax transfer is:

$$S_T = S_{CL} + S_{IP}$$

The overall cost (C_I) of the loan program to the individual is:

$$C_I = C^* - S_T$$

while the overall benefit (B_I) is:

$$(B_I) = LN - (C^* + S_T)$$

The overall cost of the program to the government (C_G) is:

$$C_G = S_g + S_T$$

FEDERAL EMERGENCY MANAGEMENT AGENCY
WASHINGTON, D.C. 20472

APR 28 1980

APR 23 1980

Henry Eschwege, Director
Community and Economic Development
Division
United States General Accounting
Office
Washington, D.C. 20548

Dear Mr. Eschwege:

I appreciate the opportunity to review the draft report "Federal Disaster Assistance: What Should The Policy Be?" As the Agency charged by the President with responsibility for overall coordination of Federal disaster response and recovery activities, FEMA has a direct concern in the entire subject matter of the report. Our comments reflect this coordinating role and address specifically two major programs which we administer: disaster assistance programs authorized by the Disaster Relief Act of 1974 (Public Law 93-288) and the National Flood Insurance Program. We defer to the Small Business Administration and the Department of Agriculture for comments on those portions of the report that discuss the SBA Disaster Loan Program, the Farmers Home Administration's Emergency Loan Program, the Federal Crop Insurance Program, and Agriculture's Disaster Payments Program.

The goal of improving the equity and efficiency of Federal disaster assistance through a better balance of loan, grant, and insurance programs is a highly desirable one, with increased emphasis on insurance offering an opportunity to provide a better mix of government and private sector risk sharing. Our specific comments on insurance aspects of Federal disaster assistance policy follow a more general review of the report.

A major problem we have with the report is the omission of a discussion of the broad range of disaster assistance programs that are authorized by the Disaster Relief Act of 1974, PL 93-288. Reference is made to the Act in Chapter 2, but only to

its having concentrated the authority to direct and supervise most Federal disaster assistance in the Office of the President and having authorized additional disaster relief programs.

The insurance, grant, and loan programs administered by FIA, USDA, and SBA are significant sources of Federal disaster assistance, but no study of disaster aid can be complete if it does not also include the grant and "service" assistance authorized by the 1974 Act and administered by the Federal Emergency Management Agency.

Under this authority, some \$2.1 billion in Federal funds has been made available for assistance to individuals and State and local governments since April 1974. Of this, about \$800 million has gone to the private sector in the form of grants and services to aid in the rehabilitation of individuals and families.

A major source of economic assistance has been provided through the Individual and Family Grant Program authorized by Section 408 of the Act. Grants of up to \$5,000 are made available to meet disaster-related necessary expenses of those adversely affected by a major disaster when they are unable to meet such expenses through other programs or other means. In FY 1979 alone, 66,207 grants were approved under this program.

Temporary housing assistance has also eased the hardship and loss of persons affected by major disasters and emergencies. This program provides temporary housing for displaced disaster victims, with no rental charged during the first 12 months of occupancy. Funding is available for limited home repairs to owner-occupied residences in lieu of other types of temporary housing resources, so that families can return quickly to their damaged homes. And grants may be made for temporary assistance with mortgage or rental payments for persons faced with loss of their residences because of disaster caused financial hardship.

Other aid to the private sector authorized by the Disaster Relief Act of 1974 includes distribution of food coupons to eligible disaster victims and disaster unemployment assistance and job placement assistance for those unemployed as a result of a major disaster.

Services which aid individuals and families include federally-funded emergency assistance to save lives and protect the public health and safety, crisis counseling and referrals to appropriate mental health agencies to relieve disaster-related mental health problems, and legal services to low-income families and individuals.

In addition to these programs of direct benefit to the private sector, PL 93-288 authorizes a broad range of assistance to the public sector. Federal funds are provided to State and local governments and qualifying private nonprofit organizations for debris clearance, emergency protective measures, and the repair or replacement of public and private nonprofit facilities, buildings, and utilities. In addition, the Federal Emergency Management Agency may make loans to those communities that suffer a substantial loss of tax and other revenues and demonstrate a need for financial assistance in order to perform their governmental functions.

While we understand that the scope of this GAO inquiry is limited to a study of the mechanisms by which assistance is provided to the private sector, we think the report should also recognize that programs and actions whose primary purpose is to aid the public sector may also have a beneficial impact on the private sector. For example, actions taken to clear and repair roads and bridges facilitate the resumption of public transportation and, thereby, improve access to commercial, industrial, and farming operations. Federal grant and loan assistance to disaster-impacted communities also provides a measure of financial aid to the private sector by lessening the added per-capita burden that would otherwise fall on the local taxpayer.

For these reasons, as well as because of the very considerable direct impact that assistance authorized by the Disaster Relief Act of 1974 has on the private sector, we recommend that more emphasis be placed on the program in the GAO report.

The discussion of "Disaster Assistance Programs" in Chapter 2 of the study contains some major omissions. While it is true that the first disaster loan programs were established as early as the 1930's, this section ignores the Disaster Act of 1950, PL 81-875, which represented the establishment of the first comprehensive disaster relief legislation centralized in the Office of the President and was a direct antecedent of the Disaster Relief Act of 1974. Although PL 81-875 was largely directed to the provision of assistance to State and local governments, it provided the first steps in formulating a coordinated Federal response to disasters and a system whereby States could apply for and be considered eligible for Federal disaster assistance.

The passage of special legislation in response to disasters had a far deeper purpose than that contained in the report. The primary purpose of PL 81-875 was to provide assistance only to State and local governments. Special legislation

such as that enacted after the Alaskan Earthquake in 1964 or the Southeast Hurricane Disaster Relief Act of 1965 were designed to provide necessary assistance for individuals that was not contained in PL 81-875. Prior to 1969, for example, there was little if any assistance directed towards individuals, and it remained with the Congress to provide legislation authorizing those programs or improvements in existing programs to accommodate the needs of individuals. It was not until the impact of Hurricane Camille on the Gulf Coast and Virginia and West Virginia that the Congress decided that a more formalized program of assistance to individuals should be instituted. Part of this was accomplished on October 1, 1969, with the passage of PL 91-79. The passage of PL 91-606 on December 31, 1970, and PL 93-288 on May 22, 1974, continued and expanded this institutionalization of disaster assistance for individuals.

The statement is made in the report's cover summary that "The [Federal disaster] policy should embody the notions that those most in need should receive the most assistance...". This concept is in direct conflict with a provision in Section 311, Non-discrimination in Disaster Assistance, of PL 93-288, which states, in part, that "[Assistance] shall be accomplished in an equitable and impartial manner, without discrimination on the grounds of race, color, religion, nationality, sex, age, or economic status." (Emphasis supplied.) Moreover, the statement in the cover summary appears to be at variance with a further statement made on page 2 of the digest of the report that "The degree of Federal assistance should not vary across income classes. Elsewhere in the report (pp 3-2 and 3-4), there is an implication that "income redistribution" is, or should be, a goal of Federal disaster assistance. We know of nothing in the history of disaster legislation that supports this implication. In view of the apparent conflict among some of the foregoing statements and between those statements and previously stated legislative intent, we recommend that the drafters of the report re-examine their position with regard to "equity" in the provision of disaster relief.

Section 101(b) of PL 93-288 states that "It is the intent of the Congress, by this Act, to provide an orderly and continuing means of assistance by the Federal Government to State and local governments in carrying out their responsibilities to alleviate the suffering and damage which result from such disasters...". (Emphasis supplied.) This has traditionally been interpreted to mean that Federal disaster assistance is intended to supplement the efforts and available resources of State and local governments, not to supplant them. This report does not address the

roles and responsibilities either of other levels of government or of voluntary relief organizations and individuals. In our view, these roles should be considered in any study that addresses Federal disaster policies.

We recommend that the word "national" in the statement on page 4-14 that "...there is no major national disaster against which property insurance cannot be written except landslides" be changed to "natural."

There are several statements in the report that do not reflect FIA's current program:

p. 2-14: "...it appears that concern is not so much with property already in the flood plain but with continuous development..."

We are also very concerned about existing property in the flood plain, subject to repeated flooding. If a property is substantially damaged by flood - 50 percent or more of market value - then the repair to the property must meet construction standards to reduce flooding such as elevation of the lowest floor above the 1 percent annual chance flood. FIA also works with other Federal agencies to remove existing property from the floodway or velocity zones through use of Community Block Grant Funds, SBA Relocation Loans and other Federal programs.

p. 2-15: "Each policy has a deductible of \$200 or 2 percent of the insured loss, whichever is greater..."

The deductible is currently \$200. There is no alternative of 2 percent of the insured loss.

p. 3-2: "Ideally, Federal disaster relief programs should... encourage wise location and relocation decisions."

The National Flood Insurance Program, through its redirection efforts is encouraging people to relocate outside of flood hazard areas after a disaster has occurred. If property owners will donate their land for open space purposes to the community, then the National Flood Insurance Program will pay the full policy limits through the constructive total loss concept. This enables the flood victim to relocate outside of the flood hazard area.

p. 4-7: "...the use of rehabilitation loans could be tied to relocation or...the purchase of insurance as a means of self-protection."

The 1362 program is designed to purchase flood damaged property and relocate the recipients from the flood hazard area.

p. 4-9: "The National Flood Insurance Program involves roughly a 50 percent subsidy under the regular program, and this describes the risk-sharing arrangement between the public and private sectors."

The experience of the National Flood Insurance Program, through a subsidized Emergency phase and a partly subsidized Regular phase, has been that roughly 37 percent of the losses and expenses is paid by the policyholder and roughly 63 percent by the Federal Government. The Federal Government percentage should decrease as more communities are converted to the Regular phase and as the percentage of insured property that is new construction, which is all insured at actuarial rates, increases (assuming the losses so far in the history of the program are representative of future losses).

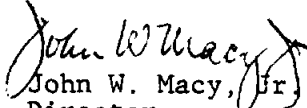
p. 5-1: "Current programs do not...minimize the possibility of Federal policy contributing to bad locational decisions."

FIA's first floor elevation requirements for new construction and its actuarial rate structure do minimize incentives for poor locational decisions.

p. 5-2: "...program designers (should) suggest preventive measures which reduce the amount of property damage at given levels of risk..."

FIA currently provides technical assistance to communities for mitigation of flood hazard risks through their land use planning efforts.

Sincerely yours,


John W. Macy, Jr.
Director

EDMUND S. MUSKIE, MAINE, CHAIRMAN	HENRY BELMONT, OHIO
WARREN E. MAQUIPOM, WASH.	ROBERT DOLE, KANS.
ROBERT F. HOLLAND, S.C.	JAMES A. MC CLINTOCK, IDAHO
ALAN CRANFORD, CALIF.	PAUL T. DEBARTOLO, N. MEA.
LANTON CHILES, FLA.	DAN I. RAYBURN, CALIF.
JAMES ABURNE, S. CAR.	H. JOHN MORGAN, PA.
JOSEPH R. BIDEN, JR., DEL.	
A. BENNETT JOHNSON, LA.	
WENDELL H. ANDERSON, MINN.	
JAMES H. EASTER, TENN.	

United States Senate

COMMITTEE ON THE BUDGET
WASHINGTON, D.C. 20510

JOHN T. MC GUY, STAFF DIRECTOR
ROBERT L. GUY, MINORITY STAFF DIRECTOR

December 15, 1978

Honorable Elmer B. Staats
Comptroller General of the United States
GAO Building
441 G Street, N.W.
Washington, D.C. 20548

Dear Elmer:

The Small Business Amendments of 1977 (P.L. 95-89) authorized deep interest subsidies for SBA disaster loans and Farmers Home emergency loans. Shortly after this legislation was enacted, crop damage was declared eligible for SBA disaster assistance. Subsequently, in FY 1978, SBA disaster loan volume shot up from an average of about \$0.2 billion annually to a record of \$2.5 billion, and Farmers Home emergency loans increased from about \$0.7 billion annually to \$3.4 billion. This unanticipated explosion in lending created severe problems for the Federal budget and raises serious questions as to whether the design of the current disaster loan program -- as exemplified by the FY 1978 disaster lending -- is appropriate.

The Senate Budget Committee has been deeply concerned about runaway spending in these programs, and we have strongly opposed legislation, such as H.R. 11445, to extend unreasonably large disaster loan subsidies with interest rates substantially below the government's cost of borrowing, which itself represents a significant subsidy to program recipients. The reasons for our concern are outlined in the attached floor statements.

The President's decision to pocket veto H.R. 11445 opens for the 96th Congress an opportunity and challenge to redesign Federal disaster relief programs so that they operate within acceptable budgetary constraints, and provide proper aid to disaster victims who are truly in need.

To assist a Congressional review of disaster spending, we hereby request the General Accounting Office to carry out a study consisting of three parts:

1. Analysis of SBA disaster loan operations in FY 1978. This section should consist of a comprehensive audit of the SBA disaster loan program in FY 1978. The audit should address, but not necessarily be limited to, the following questions:

79 JAN 2 P 2. 03

Honorable Elmer B. Staats
December 15, 1978
Page 2

- What were the reasons for the increase in SBA disaster loan volume during FY 1978? In particular, how was the level of demand affected by the decrease in interest rates, the addition of crop damage as an eligible category of business loss, and the severity of disasters in 1978 compared to disasters in other years?
- Who were the beneficiaries, by income group, type and size of business, and location?
- What was the correlation between the severity of an area's disaster losses and the amount of loans received? What factors appear to account for the observed patterns?
- To what extent could loan recipients have secured credit elsewhere?
- For what purposes were loan proceeds used?

Because SBA disaster lending interacts closely with other Federal programs, such as those of FmHA, the report should also describe other disaster assistance programs available to farm and non-farm businesses, their eligibility requirements and the benefits they offer. We request that GAO collect and analyze relevant data for SBA and FmHA that are both national and subnational, farm and non-farm, before and after the program changes made in 1977.

2. An inquiry into the basic design of Federal disaster policy. The second section of the study should broadly consider what the Federal role in disaster policy should be. What principles are relevant in delineating the Federal role in disaster aid and in specifying particular program provisions? What types of beneficiaries should be aided? How should the Federal role vary with the type of disaster?

3. Recommended program changes. The third section of the study should include GAO recommendations for changes in Federal disaster loan programs. Questions considered under this section should include, but not necessarily be limited to, the following. Should eligibility be restricted to businesses and individuals who cannot obtain credit from other sources? Should Federal loans for the repair or replacement of luxury facilities, such as swimming pools be prohibited? Should loans for damage to homes and personal

Honorable Elmer B. Staats
 December 15, 1978
 Page 3


property be targetted on low-income individuals? How can the Federal Government avoid assuming risks that should properly be borne by private individuals and firms? What rates of interest should be charged on Federal disaster loans? What categories of loss are appropriate for Federal relief? Is there wasteful duplication of effort between the Farmers Home Administration and the Small Business Administration in making disaster loans to farmers? Are there circumstances under which other methods of dealing with agricultural disasters, such as crop insurance, would be preferable to the current disaster loan programs?

Senate Budget Committee staff have advised us, based upon discussions with the staff of your Community and Economic Development Division, that our request will be handled in two separate reviews. We understand that the Community and Economic Development Division will be responsible for the first section and the Program Analysis Division for the second. Please request the staffs of these two Divisions to coordinate their work with Allan Mandel of the Budget Committee staff. A plan for carrying out the project should be developed and submitted for our review as soon as feasible.

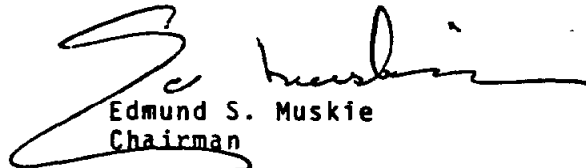
The results of the studies should be made available to the Committee in May 1979 to be used in preparing possible congressional hearings and considering legislation to reform Federal disaster relief programs. Interim reports should be submitted as major phases of the reviews are completed. In any event, we would like the final reports by July 1979.

Thank you for your cooperation in this matter.

Sincerely,



Henry Bellmon
 Ranking Minority Member



Edmund S. Muskie
 Chairman

Enclosures

Single copies of GAO reports are available free of charge. Requests (except by Members of Congress) for additional quantities should be accompanied by payment of \$1.00 per copy.

Requests for single copies (without charge) should be sent to:

U.S. General Accounting Office
Distribution Section, Room 1518
441 G Street, NW.
Washington, DC 20548

Requests for multiple copies should be sent with checks or money orders to:

U.S. General Accounting Office
Distribution Section
P.O. Box 1020
Washington, DC 20013

Checks or money orders should be made payable to the U.S. General Accounting Office. NOTE: Stamps or Superintendent of Documents coupons will not be accepted.

PLEASE DO NOT SEND CASH

To expedite filling your order, use the report number and date in the lower right corner of the front cover.

GAO reports are now available on microfiche. If such copies will meet your needs, be sure to specify that you want microfiche copies.

Single copies of GAO reports are available free of charge. Requests (except by Members of Congress) for additional quantities should be accompanied by payment of \$1.00 per copy. (Do not send cash).

Requests for free single copies should be sent to:

U.S. General Accounting Office
Distribution Section, Room 1518
441 G Street, NW
Washington, DC 20548

Requests for multiple copies should be sent with checks or money orders to.

U.S. General Accounting Office
Distribution Section
P.O. Box 1020
Washington, DC 20013

Checks or money orders should be made payable to the U.S. General Accounting Office.

To expedite placing your order, call (202) 275-6241.
When ordering by phone or mail, use the report number and date in the lower right corner of the front cover.

GAO reports are now available on microfiche. If such copies will meet your needs, be sure to specify that you want microfiche copies.