International Journal of Mass Emergencies and Disasters
August 1993, Vol. 11, No. 2, pp. 189-205

The Role of the For-Profit Private Sector in Disaster Mitigation and Response

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In an era in which free-market capitalism has been showered with more accolades than anyone ever expected it to receive, it seems especially timely to reassess economic sectors traditionally regarded as the preserve of nonprofit or governmental supply and off-limits to for-profit private activity. Of particular interest in this regard is the whole area of disaster mitigation and response, which, in the United States, at least, is experiencing an explosion of for-profit private-sector initiatives. I will survey and analyze some of these developments and offer some suggestions for policies to promote the role of private enterprise in both disaster anticipation and recovery.

The Economic Framework

The basic paradigm of economics is that of rational, optimizing consumers who equalize the benefit received from the last dollar spent on all their individual purchases. At the same time, producers in a competitive environment seek through trial, error, imitation, and innovation least-cost techniques of production directed to consumer demands of greatest intensity. Freely determined prices are the signals and, because they are also the source of individual incomes, provide the incentive to producers to meet demands at the minimum possible cost. If, further, all costs and benefits fall exclusively on the parties to an exchange—that is, are absorbed "internally"—then, for given income distribution, the free price-directed market is the most efficient mechanism of resource allocation.

The Economic Role of Government

If the basic conditions for private optimizing behavior are not met, an efficient solution may be facilitated by government. The typical failure of private markets involves public goods, whose characteristic is that they can only be consumed jointly—they emit benefits most of which are external to any individual private transaction (Weimer and Vining 1992, pp. 41-57).

For various reasons, their ownership also cannot be exclusive. Public goods thus invite free ridership and tend to be grossly underproduced by private markets. Altruistic individual behavior may, in some cases and to some degree, correct the market failure. A more durable solution, however, is likely to require—although it is not assured by—an active government presence, either as a producer or procurer of the public good, or both.

Goods likely to possess a high degree of publicness include the economy's infrastructure, such as roadways, bridges, port facilities, the power system, and the communications network. Any politically supported redistribution of the income yielded by private markets is also a public good. Damage to the infrastructure and loss of income by afflicted communities are, of course, intrinsic to disasters, any response to which must deal with both. At the same time, disasters in industrial societies impinge largely on private property and private transactions. Disaster anticipation and mitigation are therefore primarily private goods; more precisely, their consumption can be limited to individual purchasers who also receive most of the benefits.

Although market failure is a necessary condition for an effective (welfare enhancing) government intervention, it is not sufficient. As a producer, government is a nonmarket bureaucratic monopolist with all its attendant weaknesses: the lack of cost-minimizing information and incentives that come from market competitors, the disincentives to risky innovative experimentation, the vulnerability to political pressures and the seeking of economic advantage by narrow consumer and producer interest groups, and the absence of functioning prices through which recipients of government-supplied goods and services can continually express their preferences (Weimer and Vining 1992). Government supply failure may in fact exceed any market failure that occasioned the government intervention.

One partial remedy to government production failure is privatization of the supply source, with government acting only as procurer. In fact, as argued by Vining and Weimer (1990), this is always the preferred response to market failure, provided only that less interventionist policies, such as taxation or subsidization, are not feasible or that an effective contract for private production cannot be drawn up. An example of a circumstance in which a private contract would not meet efficiency criteria is the case in which the public good cannot be produced competitively. In that event, we have what the authors designate a "double market failure," which may indeed justify government production but does not, as we have seen, guarantee that government will be an efficient supplier. Even under single market failure, moreover, in which privatization is possible, many of the

limitations of public supply remain. Government may be the sole buyer, capable of manipulating the price (as of military hardware) and, even if it is not, it will still be subject to diverse political influences and without the information that individual prices, jointly determined by the intended ultimate consumers (the citizenry), provide.

The Nonprofit Private Sector

An alternative or supplement to government supply in the disaster context, as rationalized by a double market failure, is private nonprofit activity. In the Weimer-Vining classification, nonprofit organizations "typically provide public goods (the first market failure) in a context where potential contributors (governments or private individuals) do not have the information to assess whether their contribution is actually used to produce the public good (the second...market failure)" (Weimer and Vining 1992, p. 185). In such circumstances, profit-making firms may provide overpriced goods of low quality. On the other hand, because of the absence of profit and because of a strong commitment to their goals, nonprofits may appeal to donors (of cash, as well as services of labor and capital) as more likely than profit-seekers to maximize the output of the desired goods and services in disaster situations. Nonprofits will also have more flexibility in turning out heterogeneous public goods than will government, which is generally constrained to provide a more standardized service to all within a given constituent class (Weisbrod 1988, pp. 25-31).

Like government, however, nonprofits lack the example and the discipline provided by market-constrained competitors, as well as the feedback that beneficiaries of their services can transmit through freely determined prices. And there is no basis, as there is not in government, for supposing that the objective function of nonprofits is purely selfless and necessarily consonant with the optimal disaster response. Indeed, there is much evidence that some nonprofits may exploit short-term opportunities (often as a requirement of their charters) that raise their visibility in disasters and enhance their fund-raising capabilities, rather than implement an appropriate longer-term procedure (Cuny 1983, pp. 145-147).

Disasters and Nonmarket Response

Dynes (1970, pp. 7-8) reminds us that two assumptions, not always explicit, underlie the strong bias in support of centralized government and nonprofit domination of the disaster response. One, which public and volunteer agencies are especially prone to make, is that optimal postdisaster

responses are readily perceived and straightforwardly pursued: rescue, clearance of debris, provision of "essential" services. Another is that disaster victims are usually dazed, panic-stricken, and more or less helpless in the disaster aftermath (Dynes 1983, p. 658). The role of the private market is rendered unimportant by the first assumption and ineffective by the second.

Dynes makes clear that both of these assumptions are false. Mountains of empirical evidence collected mainly by sociologists, but others as well, point to a perennial and serious mismatching of supply and demand by postdisaster providers. The data on inappropriate building materials, rich or spoiled food, unnecessary medical supplies, suboptimal transportation routes, the wrong equipment or the right equipment at the wrong place, etc., are legion (Plommer 1978; Dynes 1983). The simple fact, from an economist's perspective, is that in the absence of a functioning price system, neither central authorities nor well-intentioned altruistic outsiders are likely to come close to knowing and responding effectively to the circumstances and preferences of afflicted populations (Horwich 1990).

Nor are these populations the helpless panicked victims portrayed by conventional mythology. On the contrary, sociologists have documented the adaptability, resourcefulness, and general effectiveness of survivors in coping with disasters. Indeed, those at the grass roots household, firm, and community level are the only ones with the information and incentives to forge an optimal response. Command and control centralized management is as inefficient in disaster anticipation and relief as it is in any other realm of economic activity (Dynes 1983).

Disasters and the For-Profit Private Sector

We define disasters broadly as any loss in the value of resources, both human and nonhuman, beyond some socially determined threshold and whether caused primarily by natural events (storms, floods, earthquakes) or man (equipment failures, fires, strikes, wars) (Horwich 1990, pp. 532-533). We also consider the disaster response as the whole range of shorter-run relief efforts, the longer-run recovery, and anticipatory initiatives aimed at mitigation, including contingency planning and the design of equipment and structures. In this broad perspective, the role of government both as a predisaster planner and safety regulator and as a postdisaster responder has been yielding to the for-profit private-sector on a vast scale.

Government, of course, retains responsibility for creating and maintaining public-goods infrastructure, but increasingly in a procurement rather than a producing role. The privatization trend in the advanced industrial

countries continues strong as opportunities for drawing up contracts with private providers arise in activities ranging from construction to water purification and delivery (Poole and Fixler 1987). Elements of the infrastructure, such as segments of limited access highways or fire fighting services, are even operating as private enterprises (Hinds 1989). Physical barriers to the highway, except at controlled intervals, secure the property-right in it and essentially convert it into a private (rivalrous) good. Fire protection is largely a private good. Its publicness (joint consumability) lies only in the danger posed by your neighbor's burning house. But in practice the public-good dimension can be eliminated by requiring community-based private companies to respond to all fires within the area and charging those who use the service but fail to subscribe to it a hefty fee. The actual record of for-profit fire-fighting companies is one of comparable performance and much lower cost than that of public and nonprofit providers (Tolchin 1985). Another way in which the service has been privatized is when large business or other organizations have provided their own internal fire-fighting facilities.

In the realm of natural monopoly, which is regulated by government as part of its mandate to enforce competition, new technology is rapidly ending the declining-cost basis of monopoly and restoring a purely private basis of operation. Electric power can now be transmitted vast distances, creating a competitive interstate market (Smith 1987). Telecommunication has experienced an explosion of new technologies that have rendered the entire industry potentially competitive, though only in long distance communication has government significantly reduced its regulatory role and allowed private competition to rule. On the local exchange level, effective competition requires that government recognize the new technological reality and cease issuing exclusive local franchises (Wenders 1990).

Meanwhile, the private sector has moved to reduce risk in the economy, both by improving safety features in economic output and activity and by mitigating the impact of disasters through anticipatory as well as reactive measures. We discuss each in turn.

Safety and the Market

In the pursuit of general product and workplace safety, the for-profit private sector has in fact been an active player for many years. Aaron Wildavsky (1988, pp. 42-48) documents the vast improvement in human health and safety in capitalist economies over the last several centuries. He attributes this development to a constant privately-based search and trial and error process. Operating through free and open markets, producers offer

tentative advances in safety in both products and the workplace that are accepted or rejected depending on their efficacy and the market's assessments of the resulting marginal costs and benefits. In effect, risks are reduced by the taking of risks. Wildavsky (1988) argues that the demand for safety varies positively with income and that free markets foster safety both by mediating the trial and error process and by serving as a general engine of income growth.

The frequent claim that profit-seekers tend to pursue short-run gains and neglect longer-term safety is thus at odds with the facts. There is clear evidence today, for example, that the share prices of aircraft companies whose planes crash because of a structural defect drop, as do the shares of companies whose products are recalled for safety reasons by the Consumer Product Safety Commission (Chalk 1987; Rubin et al. 1988).

This is not to say that safety is the only feature that workers want in their workplaces or consumers want in their products or that they are willing to pay for the absolute maximum amount that technology can deliver. As noted, economic agents balance risk and cost at the margin. An implication of this is that attempts of public interest groups or government, through regulation, to reduce risk are often counterproductive. Mandated automobile safety devices lower the costs of, and hence encourage, more "intensive" driving. This raises havoc with pedestrians and bicyclists, if not with the automobile occupants, who, after all, are better protected (Peltzman 1975). But even the occupants suffer: there is econometric evidence that the safety regulations increase the purchase of cheaper small, but less safe cars, although the loss of safety is at least partially compensated for by *less* intensive driving (McCarthy 1986). And, like the automobile safety standards, the benefits of requiring infants to have their own airline seats are offset—in this case by diverting travel from the air into cheaper and far more risky automobiles of all sizes.

A broad historical perspective by Eric Jones (1981) supports Wildavsky's interpretation. Jones looks at industrial history as shaped in large measure by shocks and adaptation to disasters of all varieties. Like Wildavsky, Jones sees income as the primary underlying determinant of safety and disaster mitigation. In a study of fires in the history of major world cities, Frost and Jones (1989) credit the specific use of market-produced nonflammable materials (mainly bricks and roof tiles) and increasing lot size as the primary agents of control. Although they occasionally refer to a municipal code requiring the use of nonflammable building materials (1989, pp. 341-342) and Jones (1981, p. 34) cites the "precautions insisted on by central and local authorities," the major historical development of

such materials appears to have been the outcome of unplanned market activity. Indeed, no regulation regarding safer materials could have been effective prior to the appearance of the requisite technology or the attainment of an income level at which the regulation became affordable. Nor is there evidence that the technology was generally a response to a regulatory edict (although the catalytic converter on automobiles appears to be one such example) rather than to a spontaneously expressed, income-constrained consumer demand. Finally, it appears inconceivable that government or any *single* entity could have anticipated or planned the de facto construction of brick and tiled structures in scattered, but strategic, locations where they served as fire-breaks. This spatial pattern permitted the poorer intersticed areas to seek a more affordable combination of less fire-resistant building materials, larger lots, and improved fire-fighting organization and water availability. Historically, well-intentioned broadly-enforced fireproof building codes would have lowered the risk of fire but driven the poor (the majority of the population) out of their homes into a suboptimal state in which social welfare overall was reduced.

The Rise of For-Profit Disaster Enterprise

Given the predominance of private interest in safety and disaster mitigation, the emergence of a vigorous and dynamic industry of disaster specialists should come as no surprise. Traditionally, the private sector, even in developed countries, has appeared to ignore low-probability high-cost catastrophic events. But as income rises and technology advances, including the remarkable developments in computer-based electronics, the cost/benefit ratio falls and the demand rises for the services of rescuers, restorers, salvagers, risk managers, and consultants of every stage of disaster activity.

A Historical Perspective. We can illustrate the emergence of private-sector disaster specialists graphically by the supply/demand representation in Figure 1. As pictured, the supply (S) and demand (D) for private disaster services initially fail to intersect at a quantity greater than zero and so the market fails to form. One can say, with equal force, that the demand is inadequate (a stronger demand would shift the D schedule to the right bringing it to an intersection with the supply schedule S at a positive quantity) or that the cost of disaster services, as reflected in the height of the supply schedule, is too high (a lower cost would shift the supply schedule to the right bringing it to an intersection with the demand schedule at a positive quantity).

Figure 1. Supply and Demand for Private Disaster Services at an Early Date.

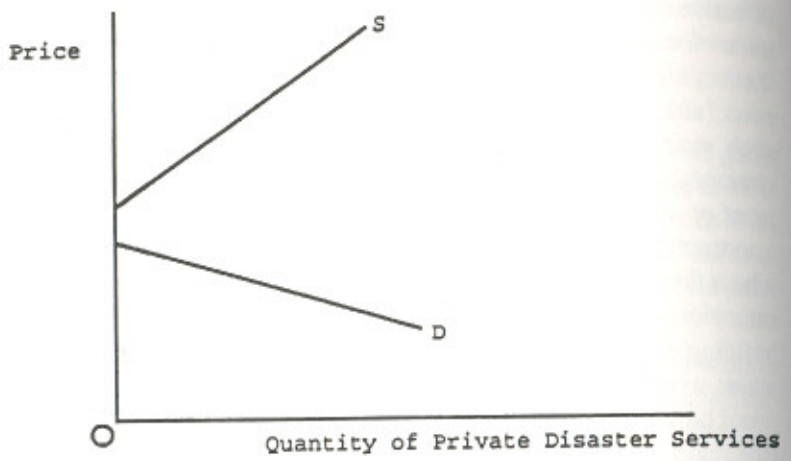
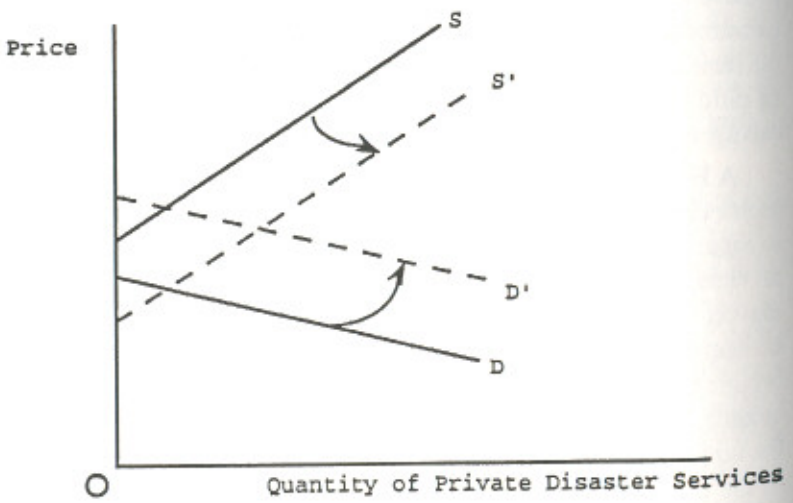


Figure 2. The Shift of Supply and Demand for Private Disaster Services over Time.



Over time both schedules shift to the right until they meet at a quantity greater than zero, as shown in Figure 2. Rising income shifts demand; additional firms enter the industry and costs fall in response to increasing scale and advancing technology, all of which shift supply.

This kind of gradual development of a private for-profit market can also explain a similar trend in the health-care industry, which, in spite of a substantial private interest, has long featured a huge public or nonprofit component in the delivery of the service (Gray 1991). The late twentieth century concern with pollution abatement in the industrial countries is another example of a slowly emerging demand, spurred by income growth. Unlike health care and disaster mitigation, however, a clean environment is largely an inescapable public good that cannot be left to private initiatives, although market-based mechanisms of abatement (emissions taxes, sale of pollution rights) mandated by government promise to increase the efficiency of any clean-up.

Although disaster service companies may initially perform as postdisaster responders, their skills readily qualify them for predisaster planning and prevention. Companies that sell rescue and restoration services are certainly poised to market disaster prevention techniques and procedures. Accompanying the growth of this industry has been a parallel development in the emergence of risk-management and emergency response officers and departments in most major business and nonprofit organizations in the country. These departments are the successors to the corporate health and safety units of 20 and more years ago. The optimal mix between reliance on internal emergency management personnel and external consultants and responders will vary, of course, with the scale of operations and the need for company-specific skills in relation to particular risks.

Playing an important facilitating role in these developments have been insurance companies, which serve as intermediaries between those seeking disaster services and private providers. The insurance companies obviously have a great deal to gain from, say, a computer salvage operation that costs only 20 percent of the value of the equipment. That was the cost ratio in the 1988 First Interstate Bank fire in Los Angeles in which the Blackmon-Mooring Steamatic Catastrophe company was able to salvage 92 percent of the bank's computers (Kissil 1990). Surveys suggest that 90 percent of *Fortune* 500 companies have disaster plans in place, often at the instigation of their insurance companies (Moore and Liles-Morris 1989).

One cannot resist comparing the joint efforts of individual companies, private disaster responders, and insurance companies with government's regulatory role, such as that of the Occupational Safety and Health Admini-

stration. It is impossible for government, in formulating its rules, to achieve the cost/benefit solution that the market participants reach through a constant trial and error process in which private wealth is the motivating force. Even if government regulations were net beneficial when first promulgated, they could not continue to be in the face of constantly changing conditions, which government cannot possibly monitor or respond to with the knowledge and flexibility of a multitude of unregulated profit maximizers.[1]

Some Specific Cases. The services available in the for-profit private sector include analysis of structural and mechanical failure, cleanup of hazardous spills, handling of toxic wastes, contingency planning (including warning systems) for both predisaster and postdisaster scenarios, support for meeting safety and environmental regulations, and disaster relief and recovery tasks of every variety. Firms tend to specialize in particular clients, such as an individual plant, company, or industry, or other organization, such as schools, universities, and governmental authorities and agencies. Clients are both domestic and foreign. Firms will also specialize in the anticipation or recovery from particular kinds of hazards and disasters, such as floods, fires, earthquakes, or storms, while not neglecting the possible joint occurrence of more than one variety.

Among established firms is the NUS Corporation, headquartered in Gaithersburg, Maryland, and with offices in a number of major U.S. cities. NUS operates mainly as a predisaster resource, offering architectural and engineering services with regard to chemical processes, waste management, nuclear power, and general support for environmental, OSHA, and industry-initiated safety requirements. NUS also conducts training programs and prepares emergency response plans for industrial clients (telephone interview 1990, 1991).

The Failure Group, Inc. of Menlo Park, California (*New York Times* 1983; telephone interview 1991) seeks the causes of system and structural breakdown. Essentially a postdisaster responder, it has investigated the collapse of the walkways in the Kansas City Hyatt Regency Hotel in 1981, the explosion of gasoline tanks in the Ford Pintos, the crash of a DC-10 airliner in Chicago in 1979, the collapse of a bridge in Louisville, Kentucky, and the loss of heat-resistant tiles by the space shuttle Columbia. Failure Group, which also operates in Canada and Europe, maintains a large data bank culled from public and private sources.

The Mitigation Assistance Corporation of Boulder, Colorado offers a wide range of pre- and postdisaster services (telephone interview 1991). It has designed warning systems and contingency plans for various disasters for governmental units, hotels, and other private entities. It has drawn up

procedures for shippers of hazardous wastes and sorted out donated goods at disaster sites.

Blackmon-Mooring Steamatic Catastrophe, referred to above, is a postdisaster salvager and restorer with 350 franchises world wide. It is particularly active in fires, floods, and the handling of toxic materials. It houses specialized cleaning and restoration facilities at its Fort Worth headquarters, while relying largely on local personnel and equipment recruited spontaneously at disaster sites.

Some consultants take a broad coordinating approach to contingencies and the whole range of decisions that would have to be made by their clients. Joshua Lichterman, interviewed in 1991, of the Emergency Management Group in Berkeley, California, asks what it would take for a major corporation to be operational 90 days after the Big One strikes Southern California. He points out that the earthquake could paralyze two-thirds (Southern California's share) of a state economy whose GNP is the seventh or eighth largest in the world. The economic impact could thus be international in scope. What immediate decisions should the company make with regard to its investment portfolio? If it's an oil company, what should its tankers at sea do with their cargoes? (Answer: Sell them on the spot market.) What plans should be made for alternative transportation routes and communication networks? The possible economic dislocation and the questions that have to be answered are endless.

Barbara Murrin, interviewed in 1991, of the Crisis Management Group, Inc. in Long Beach, California, takes a similar broad view of emergency planning, but mainly for large defense and aerospace companies. She features "off-the-rack" plans for small businesses.

Intertect, a Dallas-based firm headed by Frederick C. Cuny, offers a wide range of disaster services primarily in third-world countries (Duke 1986). Though not usually involved in the immediate aftermath of a disaster, Intertect has played a major role in the recovery period coordinating and managing entire refugee populations, taking responsibility for food and housing. It has been a primary resource following the devastation of civil war (Bengal), earthquakes (Guatemala, Mexico City), hurricanes and cyclones (Honduras, India), and famines (Sudan). Intertect, a for-profit firm, works closely with local authorities, other responders, including nonprofits, and most of all, with the indigenous population. Cuny (1983) has written critically of the inadequacies of nonprofit responders, as well as domestic government agencies that ignore the grass-roots component in restoration and longer-term recovery. Intertect not only directs the recovery and over-

sees longer-term predisaster anticipation, it offers the population training in critical aspects of self-development beyond the disaster context.

Government and the For-Profit Disaster Responders

From a public policy perspective, I think the rise of private enterprise as a natural and leading participant in disaster prevention, mitigation, and response is a desirable development that should be encouraged. The private providers offer state-of-the-art technology and specialized services in coordination and management. Thus, if governmental agencies now responsible for coordinating disaster response were to limit their activities mainly to procurement, Intertect and others like it would soon be major players in domestic disasters in the United States and other countries, as well. In fact, with worldwide mobility and outreach, such firms would achieve expertise and command resources on a scale that no local, state, or even national government emergency agency could aspire to. Just how the private entities would sort themselves out with respect to disaster variety—earthquakes, floods, etc.—or responding function—rescue, transportation, communication, etc.—or some other disaster dimension not yet thought of would be determined by a market process that cannot be predicted. Like the forces unleashed by U.S. deregulation of long-distance communication and transportation, the possibilities for innovation and enhanced efficiency are innumerable. But such a development could not, of course, occur overnight. It would come as part of a gradual process in which many institutional accommodations involving contractual arrangements and modifications in the liability law would have to be made.

Meanwhile, there are a number of initiatives government can undertake immediately, including reform of some of its own disaster-related practices. Government should begin by trying to determine why the private insurance sector, the natural arbiters of safe practice, does not do more than it already does to establish and enforce safety standards. Is risk sharing in the industry so widespread that more stringent surveillance of client behavior is not justified by the low probabilities and high administrative costs involved? Are the insurance companies handicapped by regulations that reduce their flexibility in rate setting and the accumulation of reserves,[2] or otherwise constrained so as to inhibit their use, say, of experience rating? Or is there simply a public benefit in setting safety and performance standards that private insurers cannot capture? For example, is the insurer's investment in developing effective safety standards lost to competitors who eventually impose the same standards on their own clients without sharing in the development costs? If so, are there steps government can take to subsidize

the process or assist the industry in assuring that there are no free-riders? Government should address and investigate all these possibilities with a view to facilitating the role of insurance companies in disaster mitigation.

Governments should absolutely avoid imposing price controls. Controls cripple market activity, destroying the only *systematic* mechanism that signals the preferences of disaster populations and directs suppliers toward meeting those preferences with precision. The financial inability of those experiencing serious losses to participate in the market should be remedied by cash grants. Apart from the very immediate rescue and in-kind provision that must come from the community, nonprofits, and government (including, where feasible, procurement of for-profit services), income assistance should take the form of cash as soon as markets are accessible.[3] It is, in fact, a rare disaster, except in Communist countries or severely underdeveloped regions, that completely removes market access more than momentarily. The U.S. Federal Emergency Management Agency, a national responder that follows the state and local emergency response, gave cash grants of $10,000 to those suffering property damage in the Loma Prieta earthquake in October 1989. Popular sentiment found these grants timely, equitable, and eminently spendable. They served, not inconsequentially, to defuse any and all sentiment for price controls.

The occasional temporary, but sharp price increases of basic goods, including building materials and food (perhaps milk for children) in the disaster aftermath, should be countered by still more cash subsidies to qualified families. Imposing price ceilings not only creates excess demand and a reduction of supply, but stimulates costly and wasteful search and prevents firms from bidding freely for remaining available resources. The upshot of this can be a further curtailment of business operations and employment that is all too likely to fall upon the low income people we want most to protect.

Voluntary and charitable organizations would also do well to make most of their gifts and contributions in the form of cash. Donations of goods, even if compatible with desires of recipients, have the undesirable side-effect of reducing prices and revenues of local merchants and producers. An ingenious response to this "dumping" phenomenon was devised by then Jamaican prime minister Edward Seaga (1988) following the devastating hurricane of September 1988. All donated goods were sold by the Jamaican government to local merchants at whatever price they were willing to pay. The proceeds from such sales were distributed to low-income families in the form of stamps expendable on food, building materials, etc. at freely determined prices. In this way, Jamaicans who placed the highest value on

these goods secured them; goods which nobody valued very much were priced accordingly; and all distribution of goods was undertaken by retailers, who are the individuals most qualified to do so.

Government should also re-examine its own role in treating as market failures the high cost or unavailability of private insurance in disaster-prone areas (flood plains, earthquake faults, storm-vulnerable coasts and islands) or high risk industries (nuclear power). The government subsidies for such insurance coverage lower the private cost of disasters and encourage risky behavior that raises society's costs more than it raises individual benefits. And government should re-examine the many distortions it has introduced into the liability structure by concentrating liability on suppliers of products while limiting that of consumers, on employers while drastically reducing that of employees, and on some producers (operators of nuclear power plants) but not on others (manufacturers of nuclear reactors, who have no liability for off-site damages) (Wood 1983, p. 21). There is an optimal allocation and level of liability that needs desperately to be discovered and implemented in the cause of disaster prevention and mitigation.

Other aspects of government's role in prevention and anticipation need to be reconsidered. Code-setting by state and local governments, as in residential and commercial construction, may or may not contain a public-good component—we need to study it and determine if private entities in this context can do a better job of risk assessment. Meanwhile, it is a highly politicized practice in many regions and weakly enforced in most (Penn 1981).

Other anticipatory services traditionally performed by government, such as weather forecasting, may also lend themselves to privatization and, in some instances, to for-profit provision (Ellig 1989). It can only improve under competition.

Conclusion

Private incentives have been operating throughout industrial history to provide increasing levels of safety and disaster mitigation in both the workplace and products. Recent years have seen the emergence of enterprise specializing in disaster preparedness and mitigation services. These developments can be seen as a response to growing income, advancing technology, and hence increasing affordability and protection for what is in large measure private property and private interests.

In the name of efficiency, government should accommodate these events by constantly reassessing its role in disasters so as to be compatible

with the changing state of the market. This includes avoiding duplication of activities the private sector is willing to perform and contracting out to private providers as many of government's functions as feasible. The latter might include, at some point and to some degree, disaster coordination. Government should also pursue a regulatory and liability structure that encourages self-help, does not reward unsafe and disaster-prone behavior, and maximizes the ability of private insurers to set standards for safety and disaster mitigation throughout the economy.

Reference Notes

1. Government safety legislation, often sparked by unions and other interest groups, is constrained by a 1981 Supreme Court ruling prohibiting the use of cost/benefit analysis in framing such legislation (Marshall and Briggs 1989, p. 534). But with or without the ruling, the record of OSHA in reducing workplace injuries is mixed. In the 1970s there appears to have been little effect; in the 1980s, some positive effect, possibly as a result of stricter enforcement (McConnell and Brue, 1992, pp. 334-335). In no event, however, can we say whether the economic benefits outweigh the costs. Fuess and Lowenstein (1990) provide evidence that union support for safety may be a power play aimed at driving small nonunion firms from the industry by raising their costs.

2. The U.S. Internal Revenue Service limits the size of reserves that insurance companies can hold. This effectively prohibits the huge reserve accumulations that the companies would need in order to offer insurance for infrequent but costly natural disasters. Relaxing the IRS rules could be a major step in involving private insurers in disaster preparedness and response.

3. My impression, based on informal communication with disaster specialists in government and voluntary organizations, is that of a growing frustration with in-kind donations that are often inappropriate and costly to process. Increasingly, offers of money, which the agencies or the afflicted populations can spend as they see fit, are much preferred.

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