HURRICANE GILBERT STRIKES JAMAICA: INSTITUTIONAL DESIGN IMPLICATIONS FOR RECOVERY AND DEVELOPMENT

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ABSTRACT

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This study evaluates long-term housing recovery in Jamaica following Hurricane Gilbert of 1988. Particular emphasis is placed on the impacts of a large scale housing aid program initiated by international donor agencies and the Jamaican government. Data were obtained through a survey of 240 households in disaster stricken areas, and through in-depth open-ended interviews of key informants. Householders and informants were asked to respond to questions on disaster impacts and recovery strategies used in rebuilding. Implications from the Hurricane Gilbert experience about specific administrative techniques and broad institutional design needs for improving housing recovery efforts are then discussed. Finally, a proposed strategy for designing planning institutions with a capacity to learn with people, and build new knowledge and institutional capacity through action is presented.

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In developing countries more people die and sustain property loss resulting from natural hazards now than in the past. Deaths associated with natural hazards, for example, have increased 50 percent each decade since 1950, whereas the corresponding population growth rate was only 20 percent (OFDA 1990). The adverse affects from disasters on employment, balance of trade, and foreign indebtedness are felt for years. Poverty and rapid population growth weakens the resistance of many countries to natural hazards. Many settlers are poor and cannot afford suitable land and properly serviced home sites. Landless squatters concentrate in marginal areas, increasing the magnitude of loss from natural hazards.

In 1988 the United Nations adopted a resolution designating the 1990s as the International Decade of Natural Disaster Reduction. The resolution stipulates that substantial knowledge exists on technical solutions to disaster reduction, such as delineation of hazardous areas on maps and improved structural strengthening techniques, but that less work has been done on understanding why these solutions have not been implemented (NRC 1989). In accordance with the UN resolution, national and international relief and development agencies have increasingly recognized that local organizational and individual capacity to use these solutions is inadequate (OAS 1990, OFDA 1990, World Bank 1990).

It is unfortunate, however, that the limited research on understanding the institutional side of disaster reduction and recovery has emphasized the needs and problems of industrialized societies, and has less bearing on developing countries (Kriemer and Munasinghe 1991). Moreover, the preponderance of disaster research has examined the immediate pre and post-impact phases of disasters involving warning response, evacuation decisions, and emergency sheltering, rather than on long-term recovery and development (Drabek 1986)[1].

While research on household response is limited, several studies have suggested that national and international agencies can enhance the potential effectiveness of their disaster planning programs and recovery strategies by recognizing the particular needs and capabilities of recovering households. For example, Cuny (1983), and Anderson and Woodrow (1989) contend that development oriented organizations with well-established field staffs that are knowledgeable of localized conditions are an important, but commonly untapped resource in disaster recovery operations. When these organizations meaningfully participate in long term recovery efforts, they can improve the chances that recovery aid reaches those in need and can be used to build on existing capacities of

households to solve their own problems. Similarly, Haas, et al. (1977) found that disaster planners can limit or prevent undue economic hardships on disaster stricken households by instituting rent and price control ordinances . The potential benefits from such research insights are considerable, because as Maskrey (1989) maintains, traditional national and international agencies' disaster recovery strategies fail to account for lessons from recurring disaster events, and have had little affect on household recovery efforts and in some cases unwittingly impede them.

The prevailing approach of agencies involved in disaster recovery has been relief oriented. It presumes that disaster stricken households are totally helpless without aid, and have limited capacity to cope with losses and to participate effectively in recovery programs. Given the rising losses and expanding relief budgets, this approach has clearly failed (Cuny 1983, Maskrey 1991, and Berke and Wenger 1991). What is needed is more knowledge of household needs and capacities, and how such knowledge can be translated into practice through institutions involved in recovery and long-term sustainable development.

This paper examines long-term household recovery in Jamaica from the 1988 Hurricane Gilbert disaster. Gilbert wreaked havoc on Jamaica because of winds in excess of 130 mph. Not since Hurricane Charlie of 1951 had this island nation of 2.4 million people experienced such a devastating event. Total damage to the built environment has been estimated at $US1 billion (IMPERU 1989), with a death toll of 45 and 400,000 people rendered temporarily homeless. To put the damage costs into perspective, the damage value exceeded the country's annual foreign exchange earnings from exports (Barker and Miller 1990). Thus the task of rebuilding was obviously daunting.

We begin with a brief review of previous research on household recovery, and present a conceptual approach for understanding household response. Methods used for conducting the study, and key findings from the research are then discussed. Finally, we derive lessons from the Hurricane Gilbert experience about specific administrative techniques for improving household recovery efforts, and then present a proposed strategy for designing planning institutions with a capacity to learn with people, and build new knowledge and institutional capacity through action.

Conceptual Approach for Understanding Household Recovery

While it is possible to study households from differing perspectives (Quarentelli, et al. 1988), various researchers suggest that the system concept is particularly suitable for analyzing the household disaster recovery process (LaPlante 1989, Drabek and Key 1984, Bolin 1982, Bolin and Bolton 1986, and Bolton 1979).

Under this concept a household is viewed as an open system that interacts with its environment. A household's environment includes other households, and political, economic, and social institutions.

Disasters act as major negative inputs into the household system (i.e. destruction of property, death or injury, unemployment). To deal with these negative impacts, households change how they relate to their environment. The disaster places a new set of demands or system stress on the household (Bolin and Bolton 1986 and Mileti, et al. 1975).

One way that households deal with stressful demands of disaster is to seek resources from other households and institutions. That is, households attempt to establish ties to obtain assistance in coping with disaster demands. Resources may include building materials, carpenters, temporary shelters, and loans. When disasters strike such ties typically function as support networks (Bolin and Bolton 1986).

Communities may also reorganize and establish specialized recovery task forces to deal with disaster induced demands (Dynes, et al. 1981 and Godschalk, et al. 1989). They also activate linkages with national and international donor organizations external to the community to seek aid. May (1989) indicates that a community's interorganizational relationships with outside organizations can have a considerable influence on how households respond to disasters. Because the interorganizational aid delivery system rests heavily upon cooperation in negotiating aid provisions, the implementation of these programs is often delayed and the burdens of disasters are prolonged when conflicts erupt (Berke and Wenger 1991, and Harrell-Bond 1986). A community's resource base can also influence how households respond to disasters (Wright, et al. 1979), as resources may be available through community and outside organizations rather than internally based household support networks.

Disasters result in a variety of aid delivery programs. Some focus more on centralized institutional control of aid distribution and others emphasize decentralization involving participation of disaster stricken households in self-help recovery activities (Kriemer 1984). At one extreme programs are imposed from above and do not depend on the households own resources. At the other extreme, aid programs emphasize local institution building as residents participate in rebuilding their own homes and the houses of other participants. In between these two approaches, a variety of schemes exist with differing degrees of participation.

In keeping with the systems concept, several studies have attempted to specify the principal modes of disaster recovery used by households. Bolin and Bolton (1986) and Bolin and Trainer (1978) identified two principal modes of recovery in a cross

cultural study of Nicaraguan and U.S. sample surveys. One was the autonomous mode which involves households who rely primarily on their own resources and kinship ties. The Bolin and Trianer study found that this mode was used rarely in the sample of U.S. households, but was used more frequently in the Nicaraguan sample. The second mode was the institutional mode which refers to how entwined or linked a household is with national and community based resources. As expected, this mode was used frequently in the U.S. sample, but not in the Nicaragua survey group.

Other studies explored various modes of recovery. Using data from a U.S. flood disaster and a Latin American earthquake, Bolin and Bolton (1983) highlighted cross cultural differences in recovery modes between the two study groups. Bolin and Bolton maintained that characteristics of the Latin American culture that affected recovery were strong kinship ties and the patronage system in which personal obligations rather than universal rules determined access to recovery resources. In Latin American culture continuity of employment as a result of political patronage was an important mode of recovery, while in the U.S., aid from government institutions was the dominant mode. Similarly, Drabek and Key (1984) found that aid from government was the most preferred recovery mode in a study of tornado stricken communities in the U.S.

In summary, we examine the extent to which the design of recovery aid programs facilitate or constrain household recovery actions. In particular, we examine how the autonomous and institutional modes of recovery, conceptualized by Bolin and Bolton (1986) and Bolin and Trainer (1978), are used for seeking building materials for housing[2]. We refer to the autonomous mode as informal activities, and the institutional mode as formal activities. We also explore household evaluations of government organizations involved in the delivery of recovery aid. We use two comparable samples of households drawn from two local jurisdictions after Hurricane Gilbert (the details of the research design and methods follow). The two jurisdictions had differing recovery aid programs, as well as, differences in political and socioeconomic conditions.

Data and Methods

Data for this study was obtained through a household survey in disaster stricken areas. The survey was conducted 15 months after Hurricane Gilbert made landfall (December 1989) by the Construction Resource Development Centre of Kingston, Jamaica. Previous research on disasters in developing countries (e.g., Quarentelli, et al. 1988) indicates that many, if not most, of our study households would still be recovering at the time of the interviews. Thus our data reflects resource acquisition

strategies and perceptions of recovering households, rather than completely recovered ones.

Two study sites in Jamaica were selected for an intensive examination of disaster impacts and household responses. To make the selection, the range of parishes heavily damaged in Jamaica was first assessed using available damage reports (IMPERU 1989 and ODP 1989). Because the severe impact area covered most of the country, almost all metropolitan and rural areas were affected. The impact area also included a wide range of residential property types and socioeconomic characteristics, from squatter settlements inhabited by the poor scattered throughout the country to high-cost housing in Kingston and Montego Bay.

The two sites selected for interviewing were St. James Parish and St. Thomas Parish (see Figure 1). No claim is made that these jurisdictions contain a representative sample of households in the disaster stricken portion of Jamaica. However, they provide a range of geographic, political and socioeconomic conditions of the country. St. James Parish is located on the northwest coast, and has a mixed agriculture and tourism based economy[3]. The majority of the population (157,100 in 1990) is urban (51.7 percent urban) as the parish contains the country's third largest city (Montego Bay - 1990 population of 70,300). St. Thomas Parish is located on the southeast coast, its economy is primarily low-income agricultural based, and its population (86,500 in 1990) is rural in character (25.8 percent urban)[4]. Political circumstances are also quite different. At the time of our survey St. James was a stronghold of the political party in power (People's National Party) in Jamaica, while St. Thomas is closely aligned with the opposition party (Jamaica Labour Party). We assumed that these contrasting conditions, as well as differences in the design of outside aid programs, could affect household attitudes towards government, availability of resources for recovery, and various long-term household responses to the disaster. For example, in St. James the presence of a strong economy, an urban population, and close alignments with the political party in power might lead to more resources for recovery assistance and reinforce positive attitudes toward government. In St. Thomas, these conditions might result in lower levels of resources for recovery, and lead to negative evaluations and greater mistrust of governmental actions. Thus, the logic underlying the selection of these two sites was to determine the importance of these differing conditions in explaining household recovery responses.

Initially, Jamaican Census estimates and maps were used to identify housing locations in accordance to the estimated socioeconomic status (SES) of their inhabitants. The SES estimation was then accomplished through direct observation of the extent and

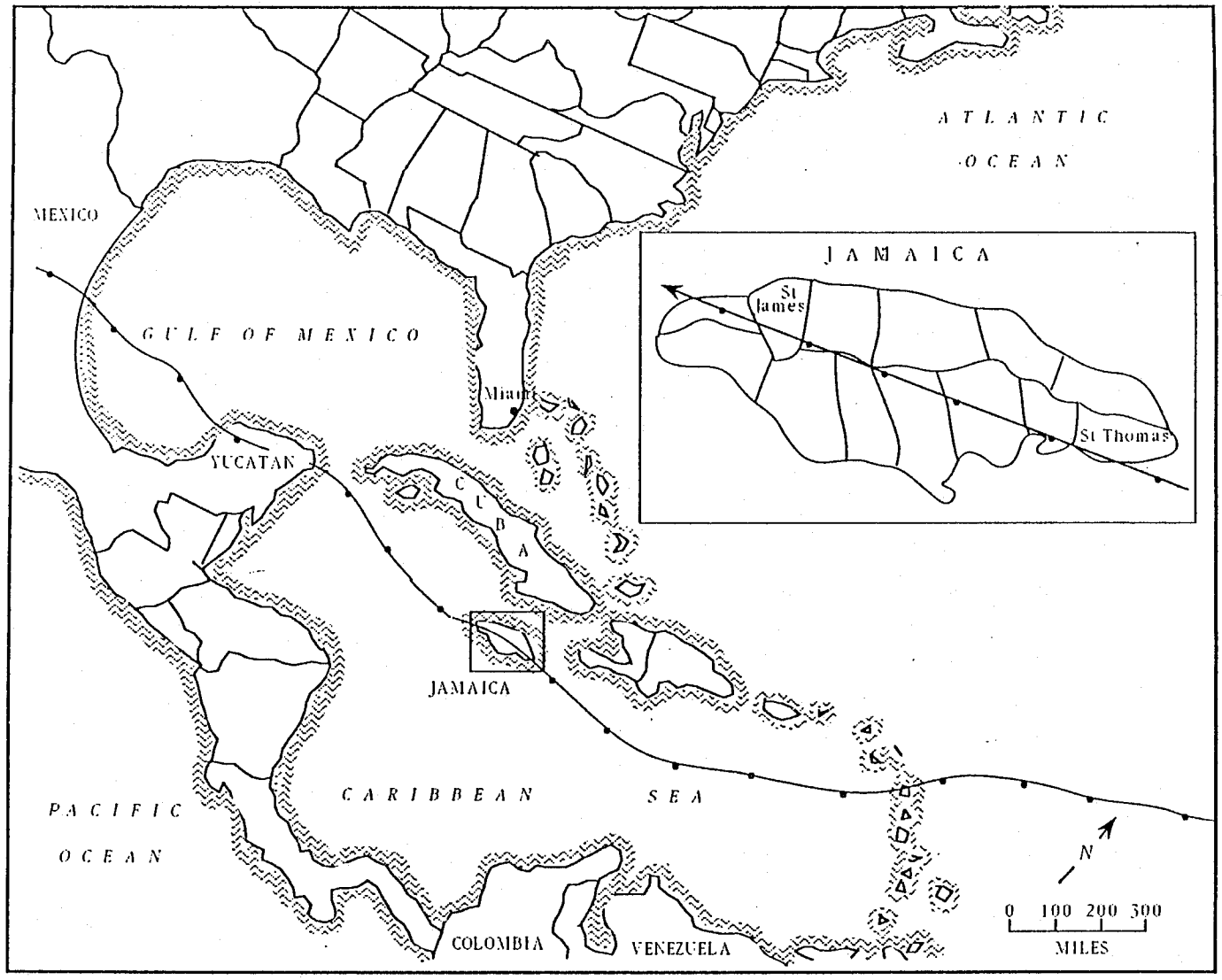

Figure 1. Map of study sites, and path of hurricane Gilbert.

quality of the public facilities and household facades, as well as dwelling sizes, services, and type of construction. Utilizing a population breakdown scheme that reflects the national distribution of socioeconomic groups (Wint and Piersenne 1984, p. 79) five housing locations within each parish were then selected. For each housing location, households were chosen for the sample in proportion to the socioeconomic group representation of the general population in Jamaica[5].

Within each housing location the first household in the sample was selected randomly, and subsequent households entered the sample through use of an increment number. Within households, respondents were selected for interviewing to satisfy the socioeconomic, gender, and age characteristics of the country. Two hundred and forty (240) households were interviewed, with 121 interviews in St. James and 119 in St. Thomas.

We decided to use the national distribution of SES across study sites to minimize differences between the two sample household groups. While we wanted a range of household types typical of each site, we were more concerned with comparability across sites. That is, it is not important that the sample be proportional across household type in each site, as long as we represent the range of types. As a result, there is some overrepresentation of lower class in the sample for St. James and underrepresentation for St. Thomas. Our logic for maintaining comparability, however, is that because we know social class is one of the most important theoretical variables in explaining household recovery (e.g., Bolin 1982, Bolin and Bolton 1986, and Drabek and Key 1984), we wanted both parishes to have the same SES representation. Consequently, any differences between the parishes will not be due to SES, but rather conditions of the parishes themselves.

To supplement survey data, we also conducted on-site, in-depth open ended interviews with householders and representatives of key organizations involved in planning, recovery and long term development efforts in each parish. A total of 12 households (six in each parish), and 33 representatives of organizations (18 in St. James and 15 in St. Thomas) were interviewed during July 1990. These informants represented agencies from such areas as health, national and local government disaster planning, public works, community development, building material suppliers, lending institutions, and various non-governmental relief and development oriented organizations (NGOs). The in-depth interviews were rich in information. They were designed to identify principal concerns about recovery issues, modes of recovery, nature of interaction among various participants in the recovery process, and to explore explanations for successes and failures of various recovery responses.

Household Characteristics and Damages

This section describes pre-disaster demographic and socioeconomic characteristics of households, and damage characteristics in St. James and St. Thomas. These characteristics vary greatly and can have an important impact on household recovery responses to the hurricane disaster. Table 1 shows no significant differences between parishes for six of eight household characteristics, including sex, marital status, housing type, income[6], insurance, and level of damage[7]. However, education and age were significantly different ($p<.01$). Further regression analysis indicated that these two characteristics were not significant factors in explaining variables related to modes of recovery activities[8]. Thus we are confident of the comparability between the sample groups.

Of particular interest are the findings for housing type and damage characteristics. Using a housing market classification model developed by Lim (1987), three categories of housing types were created based on land and house tenure status of households. *Owners* refer to households that have legal ownership title to the land and house. *Renters* are householders that have legal title to rent or lease the house and land. *Squatters* are householders that own or rent the house, but have illegal and insecure land tenure status. Table 1 shows that a majority of respondents in both parishes (51.2 percent in St. James and 56.3 percent in St. Thomas) were owners. Renters comprised the next highest proportion with 33.9 percent of the sample in St. James and 28.6 percent in St. Thomas. Squatters represented the smallest proportion with 14.9 percent in St. James and 15.1 percent in St. Thomas[9] .

Also of interest is the extent of damage sustained by the two sample groups. As indicated on table 1, damages caused by Hurricane Gilbert were devastating. Specifically, a majority of households in both groups (72.8 percent in St. James and 68.1 percent in St. Thomas) suffered heavy losses to walls and roofs or total destruction of their homes, while only 27.3 percent in St. James and 30.2 percent in St. Thomas experienced light damage to roofs. Indeed, none of the households in the St. James sample and only 1.7 percent in St. Thomas escaped damage.

While damage sustained gives a composite assessment, it does not indicate the extent to which various subgroups suffered loss. Table 2 presents findings on damages by housing type for each parish. The table reveals that squatters suffered more than renters and owners. That is, in the St. James sample, 38.9 percent of squatting households had their homes destroyed compared to none for renters and only 1.6 percent

Table 1
Characteristics of Respondents

	Percent		Chi Square Significance
	St. Thomas	St James	
Sex			.8
Male	43.0	48.7	n.s.
Female	57.0	51.3	
Education			16.8
Completed secondary school	50.4	63.4	<.01
Did not complete high school	8.7	.9	
High school graduate	10.4	12.8	
Attended college	30.4	18.0	
Marital Status			.93
Single	26.5	28.2	n.s.
Common law	19.0	23.1	
Legally married	54.6	48.7	
Age			15.9
Less than 18	0.0	1.7	<.01
18 to 35	32.2	16.8	
36 to 45	30.6	21.8	
46 to 55	16.5	26.9	
over 55	20.7	32.8	
Housing Type			.8
Squatter	14.9	15.1	n.s.
Renter	33.9	28.6	
Owner	51.2	56.3	
Income (as evidenced by occupation)*			1.0
Upper income	11.6	8.4	n.s.
Upper middle/middle	28.1	26.9	
Working class	28.1	27.7	
Poor	32.2	37.0	
Insurance			.6
Had insurance	56.7	52.5	n.s.
No insurance	43.3	48.5	
Level of Damage**			4.2
No damage	0.0	1.7	n.s.
Partial loss of roof	27.3	30.2	
Heavy loss of roof and walls	57.9	45.4	
House totally destroyed	14.9	22.7	

* See footnote 6

** The no damage and partial loss of roof categories were collapesed to compute the chi-square

Table 2
Damage by Housing Type

Damage	Percent					
	St. James Housing Type			St. Thomas Housing Type		
	Squatter	Renter	Owner	Squatter	Renter	Owner
No damage	.0	.0	.0	5.5	5.9	.0
Light damage	5.6	39.0	40.3	16.7	23.5	37.9
Heavy damage	55.5	61.0	58.1	27.8	50.0	54.5
Destroyed	38.9	.0	1.6	50.0	20.6	7.6
Totals	18	41	62	18	34	66

for owners, while in St. Thomas 50 percent of the squatters experienced total destruction in contrast to 20.6 percent for renters and 7.6 percent for owners[10].

A plausible explanation for this pattern of damages is that squatters, with insecure land tenure status, have little incentive to invest in building and maintaining well constructed housing. In an island-wide survey of damages, IMPERU (1989) found that squatters, and low-income households in general, tend to build homes that are not securely anchored to foundations, and are constructed with low-grade wooden siding and flooring. The combination of these construction practices made the housing stock of the poor an easy target for hurricane force winds.

Recovery Strategies and Evaluations

Modes of Recovery

As mentioned, recovery strategies consist of activities in which households utilize resources to overcome disaster induced losses. These activities include using aid from the government's Building Stamp Programme, relocating to find temporary housing, and acquiring building materials.

Building Stamp Programme. The primary housing aid program created after Hurricane Gilbert made landfall was the Building Stamp Programme. Under this government backed initiative, with financial assistance from the World Bank, Canada, Germany, Japan, OPEC and the United States, householders were issued building stamps based on extent of damages and financial need. Stamps could then be redeemed for their monetary value in lumber, nails, hurricane straps, zinc sheets and other building materials. Stamps could be used only at building supply stores that were members of the Jamaican Hardware Merchants Association. Stamps were restricted to householders who owned homes and had legal title to the land. Thus squatters and renters were not eligible to participate in the program.

Table 3 indicates the percent of householders in the sample who received a building stamp and the value of the stamp by parish. A greater proportion (57.1 percent) of households in the St. Thomas sample received a building stamp compared to households in St. James (30.8 percent). Similarly, the value of stamps was higher in St. Thomas than in St. James. Specifically, 39.7 percent of St. Thomas households received stamps valued at J$4,000 (US$800) or more compared to 5.4 percent in St. James. The difference in percent receiving stamps and in value of stamps between each sample group is significant ($p<.001$).

A major reason St. Thomas respondents received proportionally more stamps and at a greater value was due to a great disparity in the length of time it took to initiate the

Table 3
Building Stamps

	Percent		
	St. Thomas		St James
Received Building Stamps			
Yes	30.8		57.1
No	69.2		42.9
TOTALS	120		119
	Chi Square	df	Significance
	16.8	1	<.001
Value of Building Stamps			
Less than J$1500	37.8		39.7
J$1500 to J$3999	56.8		29.6
J$4000 or more	5.4		39.7
TOTALS	37		68
	Chi Square	df	Significance
	19.6	2	<.001

program. Assessment of damages and distribution of stamps were initiated in November 1988 (two months after Gilbert) in St. Thomas. Not until April 1989 (seven months after Gilbert), which was after a change in the party in power (JLP to PNP) precipitated by the national elections in February 1989, did St. James residents begin to receive building stamps. Recall that St. James is a PNP parish, and thus became politically aligned with the new national government. Indeed this issue was quite salient among those interviewed in St. James. While we have no evidence on whether the delay in distribution of stamps to St. James was politically or administratively motivated, there was a widespread perception among those interviewed in St. James that the decision was political. One Montego Bay householder commenting on the distribution of stamps maintained that, "If it was up to dem JLP boys we would never get noting."

Even for households that received stamps, there were concerns that the value of the stamps was insufficient to undertake necessary repairs. In St. James we suspect that many households had initiated repairs before the damage assessments undertaken by the Jamaica Defense Force (JDF) reached their homes. As a result, households either were ineligible for participation or they were eligible for considerably less aid because their homes were partially repaired at the time of the damage assessments[11]. Interviews with householders, parish building officials, and representatives of various community based NGOs in both parishes also revealed that the shortfall was partially attributed to flaws in the JDF damage assessment methodology. Because the JDF conducted only a quick and crude assessment, with no follow-up, soldiers often tended to underestimate the extent of damage. Comments like, "They didn't look closely" or "They didn't look for cracks" expressed the sentiments of many of those interviewed. Interviews also revealed concerns of JDF "being unfamiliar with local geography," "missing entire neighborhoods," and "people not being at home when JDF came."

We heard stories of individuals presenting themselves to JDF damage assessment teams as the owners of a particular house, and thus getting their name on the list to receive a building stamp, when this was not the case. The manager of a local bank indicated to us that he knew personally a family that received two $J10,000 ($US2,000) stamps for the same destroyed house. We also heard repeatedly from interviewees, many based on personal knowledge of specific cases, where two or three individuals would receive building stamps for the same damaged house.

Interestingly, despite concerns about the ineptness of the JDF, interviews revealed a consensus that damage assessments were not biased, politically or otherwise. As one homeowner indicated, "The Army had no axe to grind." There was considerable suspicion, however, that political manipulation of the list of damaged homes occurred

later. That is, certain names were added or taken off based on political affiliation. In the words of a local building supplier, "The whole system was rigged according to your politics, but the JDF was left out." Survey responses were consistent with interviews and gave high marks to the JDF. Specifically, 94.3 percent of St. James respondents and 93 percent in St. Thomas indicated that they rated the JDF as "highly effective" or "somewhat effective" during the disaster recovery period. The difference between parishes was not significant (Chi Square = .6, df = 2, n.s.).

During interviews we were told that damage assessments would have been more effectively conducted, and benefits more equitably distributed, if undertaken by NGOs like the Red Cross, church groups, and other community based NGOs. Many believed that a more locally based damage assessment would have been more complete and accurate, because such organizations have a much better understanding of local circumstances than the JDF. Compared to the JDF, local assessment teams would tend to have a much better understanding of where people actually lived, and would be better able to determine whether individuals who claim to own a specific house did and to identify those in the community who were in greatest need of housing assisstance. In fact, many local NGOs, as well as specially formed parish disaster recovery organizations, compiled their own damage lists to use in distributing their own forms of assistance. There was, however, no effort by the central government to utilize these lists to verify the JDF lists.

Households receiving stamps were also asked how they used them. Table 4 indicates that while a majority of respondents who received stamps complied with program guidelines by trading them to building suppliers for materials, there is a substantial difference in compliance rates between parishes. That is, all but 2.7 percent of St. James respondents complied, compared to 28 percent from St. Thomas. Additionally, our survey contained questions on the two primary ways people used stamps for "unofficial" purposes. In St. Thomas, 22.1 percent of the respondents with stamps traded them for goods other than building supplies prescribed by the government, and 5.9 percent traded them for cash. In contrast, only 2.7 percent of St. James respondents with stamps traded for goods, and none traded for cash.

Interviews, however, led us to suspect that the extent of unofficial uses were higher in both parishes than indicated by the survey results. It could be that unofficial uses of the stamps were underreported by survey respondents because of concern over revealing that they may have broken the law. Interview responses substantiating extensive occurrence of unofficial uses are discussed below.

A plausible explanation for the differences in compliance between parishes, is that St. Thomas is rural, while St. James is urban in character. Rural populations,

Table 4
Compliance with Building Stamp Programme

Compliance Decisions of those Receiving Building Stamps	Percent	
	St. James	St Thomas
Traded for cash	.0	5.9
Traded for goods other than building materials	2.7	22.1
Traded for building supplies	97.3	72.0
TOTALS	37	68

Chi Square	df	Significance
n.a.	n.a.	.n.a.

Note: n.a. indicates that a Chi Square could not be calculated due to inadequate cell counts.

particularly in developing countries, tend to be more isolated and self-reliant in undertaking household recovery activities than urban populations (Bolin 1982). Because of these conditions rural residents might tend to be less dependent on aid and apt to use it in ways that are not in compliance with national government backed initiatives, like the Building Stamp Programme.

Another explanation is that in St. Thomas building supply stores often helped in arranging transportation for customers. The failure of the stamp program to make adequate provision for transportation costs was seen by some as a major programmatic flaw in St. Thomas, where rural transport systems are less developed and accessible to residents compared to transport in St. James. As a result of the need to provide the stampholder with a cash allowance for transportation, public officials concurred that this shortcoming served to open up the program to even greater abuses. The fact that stampholders were going to get some cash back anyway for transportation meant that it was probably easier for hardware store owners to go even further, providing even greater cash redemptions.

Indeed, 91.2 percent of households receiving stamps from St. Thomas indicated that they had difficulties with transporting materials due to high costs, while a lower but nevertheless substantial percentage (37.8 percent) in St. James indicated transportation difficulty. This difference is significant (Chi Square = 39.0, df = 1, $p<.005$). One hardware store owner in St. Thomas estimated during an interview that van drivers were typically charging J$150 (US$30) or J$200 (US$40) to transport materials. He claimed that "People just don't have it." Some building supply stores made efforts to facilitate transportation, such as Baugh Hardware in St. James which claimed to have made free deliveries for customers. Still others, like International Hardware of St. Thomas, arranged for transportation and then deducted the cost of it from the building stamp. It was observed by the mayor of St. Thomas that some hardware stores "were getting rich from the building stamp program." One building supply store owner observed, "Eighty percent of the supply stores are doing it." A local bank manager in St. Thomas maintained that, "All the hardware stores were doing it."

Interviews with parish and other officials revealed numerous ways in which people unofficially redeemed stamps for cash or goods. In the case of cash redemption a common scenario was for the building supply store owner to agree to change, for example, a J$10,000 (US$2,000) stamp for J$6,000 (US$1,200), retaining the remainder of the stamp as a profit for the cashing service. In the words of the head of the Building Stamp Programme in St. Thomas Parish, who acknowledged that such practices did occur, "Some people were desperate to get some money in their hands." It was

apparently also common for stampholders to redeem the stamp *partially* for building supplies, and to receive back cash, or other goods which would not normally qualify under the program. We were told of cases where individuals would redeem building materials and would then sell them.

Others explained that to many of the stamp recipients it was more important to have a little money in their pocket than to "fix-back" their homes to pre-storm conditions. As long as they had made adequate repairs, and the roof was not leaking too badly, priority was given to more immediate concerns. And, after all, many people were out of work following the storm and were undoubtedly in need of cash for normal living expenses. We heard stories of some people who used building stamp supplies or cash to finance needed repairs to businesses or agricultural operations. Indeed, some of the irregularity in the stamp program was a result of individuals trying to obtain what most would agree are essential household items, such as mattresses and eating utensils.

The attitude on the part of many was that while attempts to redeem stamps for cash or other goods were not officially allowed it was understandable and indeed "O.K." A member of parliament representing the eastern constituency of St. Thomas Parish expressed these sentiments during an interview. In his words, while these transactions were unethical because "...thats not what the donor agencies intended...who's to say they can't do it...Its just between the shop owner and the homeowner and nobody is going to prosecute them."

Rebuilding. The actual process of rebuilding presented numerous obstacles to households. Materials used for rebuilding were in short supply. Because of the extent and magnitude of devastation, demand for wood, nails, and roofing quickly exhausted supplies of existing inventories. People were displaced from their homes for many months. Skilled carpenters were difficult to find. Price inflation also made rebuilding difficult, if not impossible, for many housedholds.

The late arrival of building stamps and subsequent shipment of building materials further delayed recovery efforts in St. James. Table 5 shows that delays in making materials available were indeed much longer in St. James than in St. Thomas, with 47.7 percent in St. James indicating that materials only became available 25 weeks or more after Hurricane Gilbert compared to 28.6 percent in St. Thomas. This difference is significant ($p<.001$). Table 6 provides additional information on the problems caused by long delays in distributing of supplies in St. James. That is, 40 percent of the sample households in St. James could not move back to their homes for seven months or more, in contrast to only 3.5 percent in St. Thomas. This difference is significant ($p<.001$).

Table 5
Availability of Building Materials

	Percent		
	St. James		St Thomas
Number of weeks for materials to become available			
Less than 2 weeks	32.1		61.2
2-6 weeks	10.1		5.1
7-14 weeks	10.1		5.1
15-24 weeks	34.9		5.1
25 weeks or more	12.8		23.5
TOTALS	109		98
	Chi Square	df	Significance
	38.1	4	<.001

Table 6
Number of Months Dislocated

	Percent		
	St. James		St Thomas
When did you move back into your own home?			
Did not move or less than 1 month	37.5		80.2
1-3 months	16.7		10.5
4-6 months	5.8		5.8
7-9 months	37.5		2.3
10 months or more	2.5		1.2
TOTALS	120		86
	Chi Square	df	Significance
	45.5	4	<.001

An open-ended follow-up question asked respondents who indicated that they relocated to specify the shelter strategy used. Moving in with friends was the most frequently cited strategy for households of each parish. Almost one half (49.6 percent) of St. James respondents used this strategy, compared to 28.6 percent for St. Thomas respondents. The remaining shelter strategies mentioned less often by respondents of both survey groups (10 to 20 percent) included moved in with relatives, went to an official shelter or built own make-shift shelter. These interim living arrangements are obviously disruptive to many aspects of disaster stricken and host households' lives (Bolin and Bolton 1986). Thus, it appears that delays in distributing building stamps contributed to the suffering, particularly in St. James Parish.

During interviews we were told of various strategies households used in seeking building materials. Some households salvaged materials from their damaged or destroyed homes to at least partially build back their homes. Others relied on materials donated from family and friends. Still others took extraordinary measures. In one case several residents from a middle class neighborhood in St. James flew to Miami to purchase plastic sheets for making temporary repairs to leaky roofs. Given the widespread devastation, however, seeking aid through such informal strategies only partially met the rebuilding needs of most households.

Survey findings indicate that the only formal source (purchased materials from a building supplier) of the five sources listed on the table 7 was the most frequently used. Specifically, over three-fourths of the respondents (79.3 percent in St. James and 77.3 percent in St. Thomas) bought materials from supply stores. The difference between parishes was not significant. Salvaging of materials from the householders' previous home was the most common informal source used, with 26.5 percent using it in St. James and 18.5 percent in St. Thomas. The three remaining informal sources (traded, donated from family and friends, and salvaged from the neighborhood) were used by 5.9 percent or less of the respondents. The differences between parishes in using each of the informal sources were not significant. As discussed, in developing countries, informal aid from family, neighbors, volunteers and self-help is typically more important for disaster stricken households then formal aid from the government or private sector (Bolin and Bolton 1983). However, because of widespread destruction across the entire country, rather than more localized pockets of destruction typical of most disasters, make shift forms of acquiring materials needed to be supplemented with large scale assistance.

Table 7
Acquiring Building Materials

	Percent		
	St. James	St Thomas	Chi Square significance
Purchased from building supplier	79.3	77.3	.1 n.s.
Traded	0.8	2.5	1.1 n.s.
Salvaged from previous	26.5	18.5	2.2 n.s.
Donated from family or friends	5.0	1.7	2.0 n.s.
Salvaged from neighborhood	1.7	5.9	3.0 n.s.

Price inflation posed an added burden on recovering households. The response of a householder in St. Thomas depicted the circumstances of many,

> "When we moved in with my cousin, I sold boards salvaged from what was left of our house to get some cash to help out with food and other basics but I wish I hadn't. The price of lumber has more than doubled and now I can't afford to buy anymore. We still owe money from the few boards we did buy. I borrowed it form a bank... my cousin knows the president.. everything here is done by influence you know... but the interest is too high and I don't want to borrow anymore."

Others told of the difficulty they had in finding a skilled carpenter, and of unfair prices charged for labor. Although comparison of pre- and post-disaster costs is not possible because data on pre-disaster charges were not collected, table 8 reveals that a substantial proportion of responding housedholds that hired a carpenter believed that they paid more for a carpenter than they should have. Specifically, 41 percent of sample households in St. James and 33.9 percent in St. Thomas indicated that they paid too much. This difference was not significant. Widespread media reports about the overcharging appear to corroborate with our survey findings. Indeed, the largest circulation newspaper in the country indicated that carpenters were taking advantage of people by overcharging by 200 percent or more (The Daily Gleaner, December 19, 1988).

Table 8 also shows that the daily carpenter charges were significantly higher for respondents in St. James ($p<.001$), with 38.1 percent paying over J$200 (US$40) per day, compared to 13.6 percent in St. Thomas. It is likely that the higher charges reflect the presence of an urbanized population and a strong tourist based economy in St. James. The underlying high level of pre-disaster competition for skilled labor in St. James, therefore, translated into higher disaster recovery charges.

Evaluations of Government

While identification of various actions taken by households to acquire aid is pertinent, households' evaluation of the adequacy of aid received is also important. That is, enumerations of the sources and amounts of aid do not indicate a households' perceptions of the sufficiency of the aid. Key indicators of household perceptions are evaluations of government organizational recovery efforts.

Respondents were asked to rate how well 18 different recovery issues (see table 9) were handled by the government. Two patterns of findings were derived from these ratings. First, both parish survey groups were somewhat more negative than positive in

Table 8
Payment for a Carpenter

	Percent		
	St. James		St Thomas
Paid more for a carpenter than you should have			
Yes	41.0		33.9
No	59.0		66.1
TOTALS	78		62
	Chi Square	df	Significance
	.8	1	n.s.
Carpenter charge per day.			
Less than J$100	45.2		49.4
J$101-J$200	16.7		37.0
J$201-J$300	25.0		12.4
Greater than J$300	13.1		1.2
TOTALS	84		81
	Chi Square	df	Significance
	18.1	3	<001

Table 9
Government Handling of Issues

Issue	Percent					Chi Square Significance
	Very Well 1	Well 2	Average 3	Poor 4	Very Poor 5	
Damage Assessments						
St. James n=114	14.0	15.8	29.8	28.1	12.3	30.5
St. Thomas n=115	1.7	10.4	20.0	28.7	39.1	<.001
Restoration of Telephone Service						
St. James n=109	36.7	38.5	16.5	6.4	1.8	6.6
St. Thomas n=113	25.7	38.1	28.3	4.4	3.5	n.s.
Providing Shelters						
St. James n=114	14.0	18.4	34.2	25.4	7.9	20.6
St. Thomas n=116	2.6	22.4	56.0	13.0	6.0	<.001
Demolishing Heavily Damaged Buildings						
St. James n=72	8.3	6.9	29.2	31.9	23.6	n.a.
St. Thomas n=95	1.1	5.3	28.4	22.1	43.2	n.a.
Clearing Debris						
St. James n=119	57.1	23.5	8.4	6.7	4.2	25.8
St. Thomas n=116	34.5	49.1	13.8	2.6	.0	<.001
Enforcing Mitigation						
St. James n=95	11.6	23.2	26.3	23.2	15.8	44.5
St. Thomas n=93	2.2	2.2	20.4	19.4	55.9	<.001
Beautifying Community						
St. James n=102	5.9	3.9	18.6	35.3	36.3	6.8
St. Thomas n=108	1.9	8.3	13.9	28.7	47.2	n.s.
Honestly Handling Foreign Aid						
St. James n=103	8.7	9.7	13.6	31.1	36.8	21.5
St. Thomas n=106	.0	4.7	3.8	34.9	56.6	<.001
Restore Streets						
St. James n=114	11.4	14.0	29.8	32.5	12.3	44.1
St. Thomas n=115	.9	8.7	20.9	19.1	50.4	<.001
Provide Housing Assistance						
St. James n=114	12.3	16.7	27.2	30.7	13.2	30.0
St. Thomas n=115	.9	8.7	56.5	28.7	5.2	<.001

Table 9
Government Handling of Issues
(continued)

Issue	Percent					Chi Square Significance
	Very Well 1	Well 2	Average 3	Poor 4	Very Poor 5	
Reconstructing Medical Facilities						
St. James n=118	4.2	7.6	17.8	31.4	39.0	12.5
St. Thomas n=116	.0	6.0	8.6	29.3	56.0	<.05
Informing Public						
St. James n=109	11.9	17.4	30.3	24.8	15.6	13.6
St. Thomas n=112	17.9	33.0	25.0	18.8	5.4	<.01
Restoring Water						
St. James n=120	30.0	34.2	23.3	9.2	3.3	23.9
St. Thomas n=112	7.1	42.9	40.2	8.9	.9	<.001
Reconstructing Schools						
St. James n=116	3.5	13.8	30.2	32.8	19.8	8.5
St. Thomas n=116	4.3	12.9	22.4	24.1	36.2	n.s.
Restore Transportation						
St. James n=114	6.1	17.5	21.1	34.2	21.1	29.5
St. Thomas n=111	5.4	47.8	22.5	16.2	8.1	<.001
Restore Electricity						
St. James n=120	63.3	26.7	7.5	1.7	.8	n.a.
St. Thomas n=118	63.6	29.7	5.9	.8	.0	n.a.
Making Building Materials Available						
St. James n=116	24.1	31.9	24.1	14.7	5.1	25.6
St. Thomas n=116	8.6	25.0	19.8	23.3	23.3	<.001
Provide Permanent Housing						
St. James n=106	4.7	12.3	22.6	31.1	29.3	10.6
St. Thomas n=107	1.9	3.7	15.9	45.8	32.7	<.05

Note: n.a. indicates that a chi square could not be calculated due to inadequate cell counts

Source: Adapted from DRC (1988)

their assessment of the overall government recovery effort. On the one hand, six issues (demolishing damaged buildings, beautifying the community, honesty in handling foreign aid, reconstruction of medical facilities, reconstruction of schools, and providing permanent housing) were rated as poorly or very poorly handled by a majority of both parish groups. On the other hand, only three issues (restoration of telephone service, clearing debris, and restoration of electricity) were considered very well or well handled by a majority of respondents from both parishes.

Comparison of our findings with findings from a survey of 749 randomly selected households one year after the 1985 Mexico City earthquake (Quartentelli, et al. 1988) reinforce our interpretation. Specifically, households in Mexico City were asked to rate how well 15 recovery issues were handled by the Mexican government. These issues are similar to the issues used in our sample. Unlike the somewhat negative assessments of the Jamaican government, the Mexico City respondents consistently gave positive evaluations of their government. In fact, only one issue (honesty in handling of foreign aid) was considered by a majority of households to be very poorly or poorly handled.

Differences in findings between Jamaica and Mexico can be attributed, in part, to differing cultural values and beliefs. According to Quarentelli, et al. (1988), the general absence of fault finding and blame toward the government is consistent with Mexican cultural values. However, from the perspective of many Jamaicans, the reaction would seem rather passive and unchallenging of authority. Research in Jamaica has indicated that it is a society dominated by an aggressive value system with a violent undercurrent, and that disaster stricken people tend to be more active in their reactions to disaster related problems and quick to blame organizations (Barker and Miller 1990).

The second pattern of findings derived from table 9 suggests that St. James respondents generally gave the government higher ratings for handling a range of recovery issues. That is, 9 of the 18 issues were rated significantly higher by St. James respondents ($p<.05$), while only two issues were rated significantly higher by St. Thomas respondents ($p<.001$). A partial interpretation of this finding might be that, as mentioned, St. Thomas is rural, while St. James is urban. Rural people in developing countries like Jamaica, are more self-reliant in undertaking household recovery activities than urban inhabitants (Bolin 1982). Rural residents are thus less dependent and more suspicious of outside authorities' aid distribution efforts.

Another interpretation of this finding might have to do with, as discussed, St. James being closely aligned with the PNP political party, which has been the party in power in Jamaica since the early stages (February 1989) of the Hurricane Gilbert

recovery effort. St. Thomas, however, is largely supportive of the opposition of JLP party. Given the widespread and deeply rooted system of political patronage in Jamaica (Stone 1989), it is likely that no matter what the actual aid allocations were, the party status of the parishes caused many residents to believe that politics were involved in all aid distribution decisions (Cuffe 1989). Thus, St. James residents might tend to believe at the time of the survey that they benefited from government aid allocation decisions, and St. Thomas respondents believe that they have suffered. Indeed, recall that the government's Building Stamp Programme started five months sooner in St. Thomas than in St. James, yet table 8 indicates that the St. James respondents rated the government's efforts at making building materials available significantly higher than St. Thomas respondents ($p<.001$). Specifically, 56 percent of St. James respondents rated this issue as very well or well handled, compared to 33.6 percent in St. Thomas.

Our field interviews supported and confirmed the important role of politics in the aid distribution process. There was a strong consensus among all those interviewed in St. James that the parish benefited from government decisions, and all but one of the St. Thomas interviewees believed that they did not. Interviews also revealed a strong perception in both parishes that politics not only influenced the distribution of building stamps, but also influenced distribution decisions for many other types of recovery programs, such as the repair of public services (water and health care) and roads that are under the control of the central government ministries, which are perceived to favor parishes of the same political party. Thus it would not be suprising that such ministries tend to favor parishes like St. James which are PNP strongholds, and tend to discriminate against parishes like St. Thomas which are JLP strongholds. The case of the government's zinc sheet program depicts how this politicized decision making process operates.

Distribution of Zinc Sheets

Distribution of zinc sheets was undertaken by the central government after Gilbert struck. While the program was first set up about one month after the storm, almost all of the zinc was distributed after the February 1989 national elections. Households that were most in need, including those that did not qualify for building stamps, were eligible to acquire a few sheets of zinc to temporarily repair leaky roofs and damaged walls. A system was worked out in parliament which was intended to distribute the zinc sheets in a politically balanced fashion to all parishes in the country. For each parish, zinc would be allocated to its two members of parliament (MPs) and to one "caretaker," who represents the opposition party in the parish. The central

government specified that the allotment of zinc was to be distributed through a series of specially formed disaster recovery committees in different parts of each parish. Committee membership consisted of local government officials, members of the Red Cross and youth clubs, church leaders, among others. Under the original plan of how the committees were to be used, the zinc was to be distributed according to the JDF's damage assessments.

According to the mayor of St. Thomas Parish (who was a member of the opposition JLP party), most of the committees in the parish distributed the zinc on a fair and equitable basis. The distribution by the caretakers was described as much more political. We were repeatedly told that the zinc sheets had been passed along to the opposition candidates of the parish MPs (both MPs are of the JLP party). The intent was to "buy votes" for future elections. The parish's deputy mayor was even more adamant in his belief that the zinc distribution process had been heavily influenced by politics. Because St. Thomas is a JLP parish he maintained that the government provided much greater amounts of zinc to opposition forces. He was convinced that his opponent had much more zinc than he did and distributed it for political purposes. He referred to the process as "corrupt" and that "his people" have been unfairly overlooked.

In St. James the distribution of zinc to the parish from Kingston suggested some political manipulation. First, the distribution scheme specified that the two PNP (the party in power) MPs' share was much greater than that provided to opposition party caretakers. MPs were to acquire 60,000 sheets to distribute, while the caretakers were to acquire 30,000 sheets. Second, and perhaps more serious, was that zinc supplies had come to PNP MP's and distributed to the special committees in St. James, they had never been delivered to JLP caretakers. Third, the parish MPs did not use the special recovery committees for distributing zinc. In an interview with the mayor (who is PNP) of the parish, he described a process of relying heavily upon what he described as a "network of leaders" in his district. He indicated that his organization had done their own damage assessment and had complied "their own" list of needy individuals.

Perhaps not surprisingly when central government ministries and MPs had access to a limited supply of a good such as zinc, it is only logical for members of the ruling party to be given preferential treatment. Indeed, for all people we interviewed it was almost axiomatic that zinc had gone to political supporters. In the words of one astute observer, "Where do you think the zinc going to go? Its obvious! It would be difficult for an MP to pass over a constituent in his party for someone in the other party."

Implications of the Jamaican Recovery Experience

The Hurricane Gilbert experience offers some important lessens for improving disaster recovery efforts. These lessens can be derived from an understanding of the relationship between the demands of recovery on households and the institutions through which attempts can be made to plan for disaster recovery. Households had to rely on themselves because they could not depend on government for assistance. Even when assistance was available to disaster stricken households, it was not suitable to diverse needs, as evidenced by use of the building stamps. Indeed, the high costs of securing labor and materials, inaccurate damage assessment methods, difficulties in seeking temporary shelter, lack of provisions for transporting building materials to home sites, and aid allocation based on political affiliation rather than need were among specific problems of the recovery process. While a variety of specific administrative techniques (e.g., instituting price controls for labor and materials, providing transport of building supplies, and training of damage assessment teams) that address these problems can be included in the procedural steps specified in disaster plans, the broad implications by which households and institutions overcame these problems are of greatest importance.

The evidence clearly supports arguments of previous studies (Bolin and Bolton 1986, Drabek and Key 1984, and Haas, et al. 1977) for greater sensitivity to household recovery capacities and needs when planning for disaster recovery. Households involved in the Hurricane Gilbert recovery effort used adaptive modes of recovery suggested by various studies. For example, the practice of bargaining with building suppliers to redeem aid (i.e. building stamps) for cash to defray the costs of transporting building materials, or for acquiring essential household items that did not qualify under the formal aid program, is similar to findings of other disaster recovery situations suggested by previous research (see, for example, Harrell-Bond 1986).

Households learned their way into using these practices during the recovery. The process occurred outside the institutional context in which recovery aid programs were devised. The outcome was a form of rapid cooperative learning among households and institutions. The individuals involved in this learning process realized the limitations of the recovery programs and procedures in place and consequently altered their way of doing things. The key was not inflexible programs formulated by central administrations, as evidenced by the Building Stamp Programme, but aid delivery systems with a capacity for embracing error, learning with the people, and building new knowledge and institutional capacity through action.

Kartez (1984) maintains that the basic issue is to specify the conditions in which "this kind of adaptive, situation-dependent.....learning can take place before a

crisis strikes, p.17." May (1989), Rubin, et al. (1985), and others further indicate that disaster planners typically do not confront this fundamental issue, but maintain that the major obstacle to pre-disaster planning is in motivating elected officials and administrative staff to participate in planning before disaster strikes. There may always be apathy, however, toward planning for disaster events, given their low frequency of occurrence (Berke and Beatley 1992 and Godschalk, et al. 1989). Moreover, some adaptation will always be necessary during disaster recovery. Of greatest importance, however, is the issue of developing institutional arrangements for disaster recovery planning that foster rather than constrain adaptive learning. Such arrangements would also be capable of integrating useful knowledge generated from previous research into disaster recovery planning programs.

Designing institutions that foster effective adaptation is a central issue to the field of development planning in the Third World (Korten 1980,1984 and Uphoff 1991). Development researchers have argued that sudden events, like natural disasters, offer opportunities for devising institutional arrangements that can embrace new and changing conditions, and can adaptively learn how to plan (Anderson and Woodrow 1989, and Berke and Wenger 1991). However, how to devise such arrangements for disaster recovery planning, and long term sustainable development generally, has received little attention from the traditional development planning field. Thus an important contribution development researchers can make is to suggest a learning process approach to designing effective disaster planning programs.

A Proposed Strategy for Disaster Recovery Planning

The strategy offered here provides a starting point for improving recovery planning. While there are cross cultural differences in designing effective disaster planning efforts between Jamaica and other societies, we believe that there are more similarities than differences[12] . Thus the proposed strategy should be of use to other countries threatened by natural hazards.

The strategy maintains that actions needed to be taken must be mutually supported, with no single group -- whether government, NGOs, or citizens -- acting alone. It recognizes that the central government should be involved in distributing large scale disaster assistance. The Jamaican experience suggests that the JDF damage assessment procedure, the Building Stamp Programme, and the zinc distribution initiative were about the only ways a massive nationwide housing recovery aid effort could be organized. It also recognizes that putting people first in recovery efforts comes down to tailoring the design and implementation of programs to the needs and capabilities

of people who are supposed to benefit from such programs. Achieving the purposes of people-centered recovery, as well as long term development, implies a substantial decentralization of authority and involvement.

A variety of changes are implied. Central authorities must *act to build and support the capacity of people to be more effective in meeting their own needs* rather than *act to meet needs for people.* As articulated by Gran, the strategy would assign to the individual the role not of subject, but of actor "who defines the goals, controls the resources, and directs the processes affecting his or her life (Gran 1983, p. 146)." Such a participatory approach would lead to less dependency on government and foreign donors, and greater self-reliance from recovering households.

As illustrated on Figure 2, the strategy consists of three broad dimensions: needs of disaster stricken households; program design; and organizational capacity. Efforts are successful when the recovery program in place is responsive to household needs, and builds a strong organization capable of achieving program goals. That is, a high degree of *fit* among program design, household needs, and the capacities of the assisting organizations increases the chances for successful recovery efforts.

The concept of fit is of central importance in the field of development planning as research has illuminated the important relationships among task, context, and organizational capacity, concluding that the performance of an organization is a function of the fit achieved among these dimensions (Korten 1980). Although the concept is simple, the elements that go into achieving fit are varied and complex, especially when the concept is applied to participative disaster recovery.

Figure 2 shows that the fit between households needs and program outputs (i.e. type, amount, and timing of aid made available) is crucial. As was evident in the distinctions between St. James and St. Thomas Parishes, needs are a function of the political, economic, and social context in which the households operate. For example, lack of transportation of building supplies was a major shortfall in St. Thomas, but not in St. James. Thus for purposes of determining appropriate program output, needs cannot be adequately understood independent of context.

The fit between households and assisting organizations is crucial, as well. This involves the fit between the means by which households are able to define and communicate their needs, and the processes by which the organization makes decisions on aid distribution. This requires changes at the household level. In particular, it requires people becoming involved in conveying to local organizations information about their needs and capacities. Such organizations can rely on well established field staffs in a disaster stricken area that, compared to JDF damage assessment teams, are more

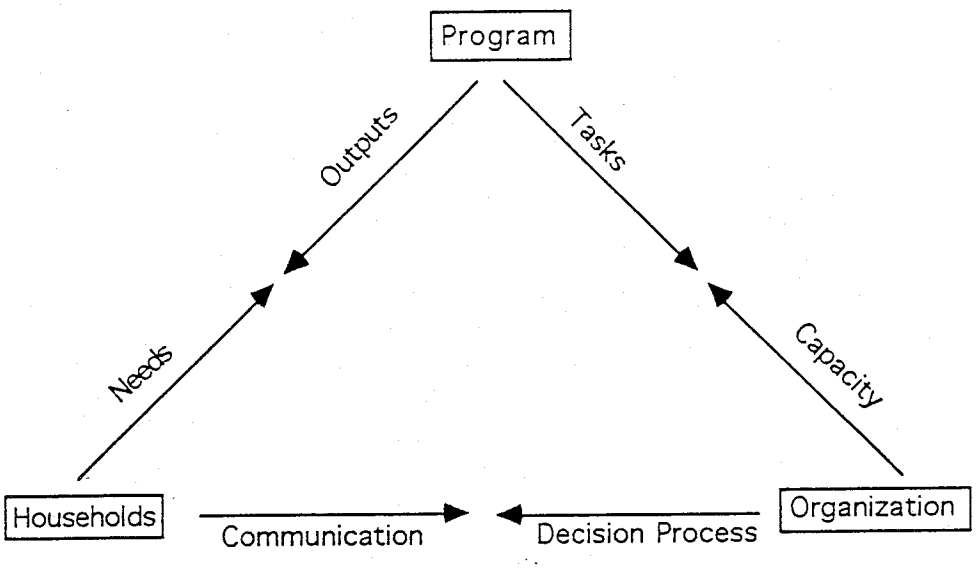

Figure 2: Fit Requirements for Disaster Recovery Planning

Source: Adapted from Korten (1980)

familiar with local damage patterns and needs, and better able to provide opportunities for local people to participate in organizational decision making. Changes are also required at the organizational level (i.e. developing ways for the organization to respond to information on household needs and capacities). The Hurricane Gilbert experience demonstrated the need for better coordination in sharing information among central and local organizations. Local organizations, for example, could have played an important role in developing and cross checking JDF damage lists to identify those in need and to counter allegations of partiality and political pressure. It also would have reduced delays in damage assessment which caused many households to become ineligible for aid because they had made repairs prior to arrival of the assessors. In sum, the degree of success in this fit will largely determine whether the intervention builds or diminishes household and community capacity for local problem solving.

A final important fit is between the task requirements of the program and the capacity of the organization charged with disaster recovery planning. The task requirements are actions taken by an organization to acquire recovery aid (i.e. program inputs) and make it available to the disaster stricken households (i.e. program outputs). Organizational capacity relates to the capability of the organization to effectively carry out the tasks. Capacity is comprised of organizational resources, such as staff political skills and technical expertise,and budget. The central government can strengthen the capacity of local organizations to acquire and deliver aid. In turn, local organizations can enhance the intentions of central government ministries through use of their well established field staffs and knowledge of local circumstances to carry out task requirements of acquiring and making aid available. Unfortunately, local organizations were largely ignored in the central government's recovery efforts throughout the disaster recovery period. Nor were they given resources to build up local people's capability to manage their own recovery problems.

Development of effective recovery planning efforts requires adaptation of the specific characteristics of program designs and organizational capabilities to different social, political, and economic contexts. However, the process by which programs and organizations are developed take on a common characteristic that emphasizes participation and local initiative. The experiences derived from recovering from Hurricane Gilbert illuminate why effective fit is rarely achieved in disaster recovery efforts through top down, inflexible and standardized approaches. Rather success is based on a process of bottom up program and organizational development, a *learning process* approach.

Examination of the Hurricane Gilbert recovery effort suggests that the top down approach was substantially adapted in some instances. When adaptation occurred, it emerged out of a learning process in which households and private businesses (i.e. hardware stores) modified their ways of doing things to create a recovery aid delivery program which was not sanctioned by the government, but was more successful at achieving fit between needs and capacities of the households, and those organizations involved in providing the assistance. Mutual adaptation and adjustment, rather than top down centrally planned approaches, were the keys to success.

The Jamaican experience strongly suggests the need to take the bottom up, capacity building process which builds on first hand knowledge of the people and their needs. Disaster stricken people are not completely helpless and totally dependent on outside aid as is often reported by the media and outside aid organizations seeking to drum up support for donations, rather they have substantial capacity for initiating their own modes of recovery and for learning and change. This should lead to the creation of organizational capacities better able to design aid programs to address these needs using largely locally available resources.

Finally, central governments and international donor organizations should recognize a disaster as providing a window of opportunity to pursue activities that are not necessarily related to the disaster. These organizations can advance long term developmental work by strengthening local capacity, and not do the work themselves. Enhanced local capacity resulting from disaster recovery work can enable local organizations to undertake a variety of long term development actions, such as improving construction practices for hazard mitigation, and undertaking agricultural development, and soil and water conservation projects.

Notes

[1] We refer to the broadly focused disaster case studies using general social survey techniques.

[2] The Bolin and Trainer (1978) conceptualization is applied in the U.S. context in Bolin and Bolton (1986).

[3] St. James Parish, for example, has 6.2 percent of Jamaica's population with 41 percent of the country's hotel rooms, while St. Thomas has 3.7 percent of the population with less than 1 percent of all hotel rooms (Jamaica Planning Unit 1990). Also St. James has only 4.7 percent of all farms in Jamaica compared to 9.1 percent for St. Thomas (Jamaica Planning Unit 1990).

[4] The population data was taken from a Jamaican census report (Jamaica Planning Unit 1990).

5 Areas surveyed in St. James Parish include Cornewall Gardens, Porto Bello, Unity Hall, Montego Hill, Bogue Heights, and Norwood. In St. Thomas Parish these areas include Seaforth, Morant Bay, Nutts River, Lyssons, Port Morant, and Dalvey.

6 Income categories were derived from an occupation classification scheme for Jamaican residents (Wint and Piersenne 1984). This scheme was used for asking householders what their annual income was. It is particularly difficult to determine income levels for poor households as income is often sporadic and household members do not typically add up money earned each month or year (CRDC 1990). Moreover, determining low income is especially difficult if a person does not get paid regularly. Thus to obtain a general income level estimate for households the Wint and Piersenne occupation classification scheme for the Jamaican population was used.

7 On the survey questionnaire "light damage" indicated partial roof loss and "heavy damage" referred to severe damage to roofs and walls. These two damage classifications, along with the "no damage' and "destroyed" categories were consistent with building damage categories used for determining eligibility for the government's chief housing recovery aid program -- Building Stamp Programme.

8 Logistic regression was used when the dependent variable is dichotomous. Variables presented on tables 2 through 8 were dichotomized. For example, table 3 indicates whether a household received a building stamp or not, and table 4 indicates whether a household complied (traded for building supplies) or did not comply (traded for cash or other types of goods). Least square regression was used to explain variation in index values created from tables 9. Foe example, an index value for table 9 is the number of issues government handled well or very well.

9 Caution should be used in interpreting these housing distribution findings. Clarke (1989) has documented numerous obstacles to obtaining accurate assessments of the squatter population in Jamaica (e.g. high mobility, no formal address, and reluctance to divulge land tenure status), and the resulting wide variations in squatter populations estimates. In a survey of 342 households in four parishes recovering from Hurricane Gilbert, Cuffe (1989) found squatters were underrepresented and renters overrepresented in the sample. The study noted that numerous squatters misrepresented their land tenure arrangement. This response was likely due to fear over not being able to qualify for housing recovery assistance under the government's Building Stamp Programme. This program required legal land tenure status for eligibility.

Cuffe's survey, however, was conducted three months after the disaster (December 1988). At the time only a small proportion of the building stamps were distributed and there was a strong reluctance among squatters to divulge their tenure status. Our survey may not have encountered this problem as extensively as the Cuffe survey, because it was conducted 15 months after the disaster (December 1989) when about 90 percent of the building stamps had been issued. Thus at least for concern over reluctance to indicate tenure status in connection with receiving aid, we consider our data on housing distribution to be reasonably accurate.

10 These findings were consistent with Cuffe's (1989) findings on damages.

11 A second, but less important reason, was that St. Thomas householders that had completely destroyed homes were issued a stamp with the maximum

benefit (J$10,000), but in St. James such householders were not. Instead, St. James residents were given a complete housing kit known as the Hexcell house, while St. Thomas residents could use the maximum stamp for obtaining building materials or a Hexcell house. This discrepancy, however, is not likely to induce major changes in findings presented in table 3 as only 1.6 percent of the eligible households in the St. James survey group were destroyed (see table 2).

[12] Quarentelli, et al. (1988) and Bolin and Bolton (1983) claim that while there are cross cultural differences that should be accounted for in the design of recovery programs, there are more similarities. Thus these researchers claim that lessons derived from recovery experiences of differing societies can have much cross cultural utility.

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