HOUSEHOLD RECOVERY FOLLOWING HURRICANE GILBERT: ST. JAMES AND ST. THOMAS PARISHES, JAMAICA

Philip R. Berke, Timothy Beatley and Clarence E. Feagin

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Hazard Reduction & Recovery Center
College of Architecture
Texas A&M University
College Station, TX 77843-3137

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EXECUTIVE SUMMARY

Introduction

Little data is available on long-term household recovery from disasters. Previous research only partially addressed the long-term impacts of disasters as there are relatively few studies of recovery. Moreover, absence of recovery research is particularly true of developing countries like Jamaica. To obtain a better and more complete understanding of the diversity of household recovery responses this study presents a description of household recovery from Hurricane Gilbert of 1988 inJamaica.

Data and Methods

Data for this study was obtained through interviews of residents in St. James and St. Thomas Parishes. The interviews were conducted 15 months after Hurricane Gilbert struck (December 1989). Two hundred and forty (240) households were interviewed, with 121 interviews in St. James and 119 in St. Thomas.

Householders in each parish were asked to respond to three sets of questions to obtain data on: 1) pre-disaster household characteristics and disaster impacts; 2) recovery strategies, and evaluations of government and non-government organizations; and 3) recovery outcomes involving mitigation and compliance with donor guidelines.

Conclusions and Recommendations

This study offers some significant lessons for the design and implementation of post-disaster recovery programs in Jamaica. It also should be of use in the development of disaster recovery planning programs in countries that have not recently experienced a disastrous event.

Conclusions

1. Squatters suffered more damages to their homes than renters and owners in both parish survey groups. Given the insecure land tenure status of squatters, there is little incentive in building and maintaining well constructed housing. Squatters, in particular, and low income households generally, tend to build homes that are not securely anchored to foundations, and are constructed with flimsy zinc roofing and low-grade wooden siding and flooring.

2. A significantly greater proportion of responding households in St. Thomas received a building stamp compared to the St. James sample. Similarly, the value of stamps was significantly higher for respondents in St. Thomas. This disparity between sample groups was likely due to the stamps being distributed five months later n St. James than in St. Thomas. As a result, St. James 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 assessments.

3. There were widespread concerns in both parishes that the dollar value of the stamps was not sufficient to undertake necessary repairs. Such undervaluations were commonly attributed to faulty damage assessments by the Jamaica Defense Force (JDF). The assessments were characterized as quick and crude, and the assessors were considered to have inadequate knowledge of localized construction and repair practices.

4. A major problem constraining household recovery was transporting building materials to homesites. Over 90 percent of the respondents from each parish indicated that they had difficulties with transporting materials. The Building Stamp Programme contributed to this problem as it did not account for transporting materials to homesites.

5. The long delays in distributing building stamps caused, in part, a substantial proportion (40 percent) of responding households in St. James to temporarily relocate from their homesites for seven months or more, compared to a small proportion (3.5 percent) in St. Thomas. However, we suspect that this problem might not be crucial for Jamaicans. That is, there is a severe housing shortage in St. James, and in Jamaica in general, and people are quite resourceful in seeking housing on a daily basis under difficult conditions. They are also accustomed to helping out friends and relatives in times of need. Thus, even with the substantial proportion of responding households being forced from their homes in St. James, we suspect that problems with dislocation were not as severe for Jamaicans as they might be for other societies like Canada or the United States.

   Another problem attributed to delays in distributing building stamps in St. James were delays in making materials available for long-term rebuilding. Nearly one-half (47 percent) of St. James responding households had to wait eight weeks or more for materials, compared to only 28.6 percent in St. Thomas.

6. Respondents in both parishes were more likely to use formal sources of assistance than informal ones in seeking materials for rebuilding. A much greater proportion of respondents from each parish obtained materials from building supply stores, which are considered a formal source, compared to informal sources, such as salvaging materials from previous homes or surrounding neighborhoods, trading for materials, and receiving donations from family and friends.

7. A much greater proportion of respondents in each parish (67.2 percent or more) hired a carpenter for making permanent repairs, compared to 13.5 percent or less that used different types of informal assistance (making repairs themselves, or seeking assistance from family, friends or volunteers). However, about one-quarter of respondents from each parish experienced difficulties in finding qualified carpenters due to a dramatic increase in demand for carpentry services after the disaster. Reflecting this increased demand were the substantially higher prices charged by carpenters. Indeed, 41 percent of respondents in St. James and 33.9 percent in St. Thomas believed that they were taken advantage of and paid more than they should have.

8. There is a diversity between parish survey groups in evaluations of how well the Jamaican government handled a wide variety of recovery issues. While survey results indicate that both parish groups were generally more negative than positive in their assessment of the overall government recovery effort, St. James respondents gave the government higher ratings in handling recovery issues. A partial explanation of this finding was that St. James Parish was aligned with the opposition party. Thus given the widespread and deeply rooted system of political patronage in Jamaican politics, it is likely that no matter what the aid allocations were, the party status of the parish led respondents to believe that politics were involved in all aid distribution decisions.

   Another explanation would be that the St. James population is urban in character, while St. Thomas is rural. Because of the tendency of rural people to be more isolated and self-reliant in undertaking recovery activities than urban inhabitants, it is likely that St. Thomas residents would be more suspicious and less dependent on outside authorities.

9. There is also considerable diversity between parish survey groups in evaluations of the effectiveness of various organizations' recovery responses. That is, St. James respondents gave higher effectiveness ratings than St. Thomas ratings. Again, this finding was expected given differences in political affiliation with the national government and in degree of urbanization.

   In addition, both survey groups gave higher effectiveness ratings to non-governmental organizations, in contrast to governmental organizations.

10. Of those respondents who were insured, slightly more than one-half from both survey groups indicated that they did not have adequate insurance to cover all damages. Further, 59.1 percent of St. James respondents with insurance and 44.1 percent from St. Thomas had difficulties in receiving payments, with delays of three months or more in receiving payments being the most frequent complaint.

11. Respondents from both survey groups were highly supportive (95 percent or more) of residents taking responsibility for mitigation, and for government taking action to limit construction and enforce building codes to ensure mitigation in hazardous areas. However, about three-fourths of the respondents from both groups were in agreement that government has not done enough to improve mitigation efforts in Jamaica to reduce potential loss from future hurricanes.

12. A majority of responding households in both parishes did not undertake mitigation actions during rebuilding. There are several potential explanations for the limited mitigation activity in both parishes. One was because most rebuilding occurred in the informal sector of the Jamaican economy where reconstruction is largely undertaken by individual homeowners and carpenters who give little attention to formal building codes. Other explanations were difficulties in finding qualified carpenters who were familiar with structural strengthening techniques, and inadequate building code standards.

13. There was widespread belief that squatters and renters were more likely not to mitigate during rebuilding (CRDC 1990). Our data, however, revealed that being a squatter or renter was not indicative of whether a household undertook mitigation action. Instead, being a respondent from St. James Parish was a strong positive indicator of mitigation action.

14. Because of delays in obtaining building stamps and supplies, we expected that St. James respondents would be less likely to undertake substantial repairs because of lack of timely assistance. Contrary to our expectations, a significantly greater proportion of St. James respondents (41.3 percent) undertook mitigation during rebuilding, compared to respondents in St. Thomas (28.6 percent). An explanation of this distinction is that because St. Thomas Parish respondents are more likely to be politically alienated towards government than respondents in St. James Parish, they would be less apt to react positively and support any government backed programs involving reducing risk from future hurricanes. They may also be more accustomed to coping with uncertainty, and have higher confidence in their ability to adapt to unstable social settings, such as disaster recovery periods, and thus not be inclined to undertake mitigation actions.

15. Similar to findings on differences in mitigation effort between parish groups, there is considerable diversity between survey groups in how respondents used building stamps. Specifically, there is a significantly greater proportion of St. James respondents (97.3 percent) using building stamps as prescribed by the Jamaican government, compared to respondents from St. Thomas (72 percent). We suspect that the reasons for the differences in compliance are similar to the reasons for differences in mitigation effort (see conclusion #14) between the survey groups.

16. Interview data revealed that for some building stamp recipients it was more important to trade them in for cash or household goods than to repair their homes to pre-disaster conditions. As long as they made adequate repairs, like keeping the roof from leaking, priority was given to meeting more basic and immediate household needs, such as mattresses and eating utensils.

Recommendations

The recommendations offered here provide a starting point for improving the recovery planning program in Jamaica. They also serve as a strategy for achieving a more sustainable society. The strategy recognizes that recovery, hazard mitigation, and long-term sustainable development are interrelated activities. All these activities require planning, depend on similar information bases, and should be considered in recovery programs. The strategy also maintains that actions needed to be taken must be mutually supported, with no single group -- whether government, NGOs or citizens -- acting alone. While the following recommendations provide broad strategic directions, specific recovery activities and priorities need to be worked out for Jamaica:

1. Recognize that the national government should be involved in distributing large scale disaster assistance, and that the JDF damage assessment procedure and the Building Stamp Programme were about the only ways a large nationwide housing recovery aid effort could be organized. There are, however, several aspects of the programs that could be improved, particularly associated with disaster aid being largely funneled through a centralized, bureaucratic and highly politicized national government.

2. Develop a damage assessment and building supply distribution system which bypasses political allegiances by finding, where possible, non-governmental and thus politically-neutral means of distribution of disaster recovery aid. This action might involve the creation of politically independent parish and community level organizations (i.e., Disaster Recovery Task Forces) which could swiftly and objectively help assess damages and distribute disaster assistance. These organizations should heavily rely on well established field networks of NGOs and work in consultation with local government officials. Task Force participants would thus have an intimate understanding of the circumstances of residents and would be more impartial in allocating benefits, compared to national government agency staff.

3. Formally designate local Disaster Recovery Task Forces to assist in damage assessment and aid distribution, and to give overall direction to long-term recovery. Actions needed to establish this type of organization are to specify: sphere of responsibility during pre- and post-disaster periods; membership; procedures for activating the organization; and responsibilities of each member.

4. The Disaster Recovery Task Force should also prepare disaster recovery plans to guide future disaster activities at the localized level. The plans should build on lessons learned from Hurricane Gilbert recovery experiences.

5. Domestic and international housing aid programs should rely on local people and leadership whenever possible. Such reliance can facilitate long-term recovery and can improve the chances for increasing local commitment and a sense of ownership of recovery planning and risk reduction initiatives. These programs should emphasize building up human skills, like carpentry, and not solely rely on physical and material assistance.

6. Build in more flexibility in the Building Stamp Programme to allow recipients to use stamps to purchase a wide variety of materials that are suitable to their specific recovery needs.

7. Temporary repairs, particularly when disaster stricken households must wait for six months or more for assistance, should not disqualify households for recovery assistance. Disaster recovery programs should be designed to encourage self-initiative and not discourage it.

8. Set up a continuous system for monitoring building supply store transactions in transferring supplies to aid recipients to ensure that they follow program procedures.

9. Impose the threat of certain penalties to be imposed on aid recipients and building supply store owners if abuses are detected.

10. Educate building supply store owners about the Building Stamp Programme, and other related recovery programs that might involve supply stores, to ensure that owners understand program procedures.

11. Provide for transport of building materials as part of the Building Stamp Programme, especially for those disaster stricken households with limited resources to either pay or arrange for transportation.

12. Need and not secure land tenure should be a requirement for qualifying for long-term housing recovery aid. A national housing aid program should, therefore, be designed to account for the range of land tenure patterns.

13. Increase budget and staff of the lead Jamaican disaster recovery organization (Office of Disaster Preparedness) to strengthen its involvement at the parish and community level in enhancing local capacity to undertake disaster recovery planning.

14. Private insurance companies should regularly notify customers on a monthly billing statement, or some other means, to check whether their hazard insurance covers the full value of their property. Because property values continuously change, it is crucial that homeowners purchase coverage that is not under or over valued.

15. Establish a public information program with communications aimed at reaching all social groups at risk. Special attention should be given to low income groups with no secure land tenure status, and to rural people who are isolated and tend to distrust government initiatives. The program should relate national and international risk reduction concerns to local situations, and should cover: information about hurricanes and their effects on Jamaica; updates on programs and plans for recovery information for homeowners and businesses which describes assistance programs and "how to" instructions for repair; continuous progress reports on major recovery problems and responses to such problems.

16. Review existing building codes and compliance procedures for adequacy in relation to hurricane forces to assure safety. This step requires the updating of the Caribbean Uniform Building Code, particularly for small buildings, and the hiring of additional inspection staff. Such staff, however, should not be viewed as "enforcers" of the code, but as extension specialists who act as promotes and trainers of appropriate building construction practices. Further the code should not be viewed as "regulations," but as a guide for providing sound construction practices.

17. Define areas where new building construction should be prohibited or subject to special requirements to assure safety.

RECOVERY FROM HURRICANE GILBERT IN JAMAICA: RESULTS OF A HOUSEHOLD SURVEY

Little data is available on long-term household recovery from disasters. Previous research only partially addressed the long-term impacts of disasters as there are relatively few studies of recovery. As noted by Drabek (1986), La Plante (1989), Rubin (1985) and others, the recovery phase is the least researched and most poorly understood of the four phases of a disaster - mitigation, preparedness, response and recovery. Moreover, absence of recovery research is particularly true for developing countries (Solo 1991).

To obtain a better and more complete understanding of the diversity of household recovery responses this study presents a description of household recovery in Jamaica from Hurricane Gilbert of 1988. The description will focus on three categories of factors presented in chronological sequence: 1) pre-disaster household characteristics and disaster impacts; 2) recovery strategies, and perceptions and evaluations; and 3) recovery outcomes. Household characteristics, such as income, housing type and education, are indicators of the initial state of households that are disrupted by a disaster. Damages refer to the extent of destruction to homes. Household characteristics and damages sustained can have an important impact on household attitudes and evaluations of government and non-government organizations involved in the disaster recovery effort. They can also influence the nature and effectiveness of recovery strategies. Such strategies are the basic modes of recovery actions, including seeking aid from official sources (insurance companies, and domestic and international donor organizations), and unofficial ones (self-help, kin, neighbors and ad hoc volunteer organizations). The combination of household characteristics, damage impacts, perceptions and evaluations, and recovery strategies lead to various recovery outcomes involving incorporating mitigation measures (structural strengthening and housing relocation), and complying with donor guidelines in using housing recovery aid.

Data and Methods

Data for this study was obtained through interviews of residents in disaster stricken areas. The interviews were conducted 15 months after the disaster (December 1989) by the Construction Resource Development Centre of

Kingston, Jamaica. Previous research on disasters in developing countries (e.g., Disaster Research Center 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 areas and most 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. The population is primarily urban as the parish contains the country's third largest city (Montego Bay - 1982 population of 70,300). St. Thomas Parish is located on the southeast coast, its economy is primarily low-income agricultural based, and its population is rural in character. Political circumstances are also quite different. St. James is a stronghold of the political party in power (Jamaica Labour Party) in Jamaica, while St. Thomas is closely aligned with the opposition party (People's National Party). We assumed that these contrasting conditions 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 an greater mistrust of governmental actions. Thus, the logic underlying the selection of these two sides was to determine the

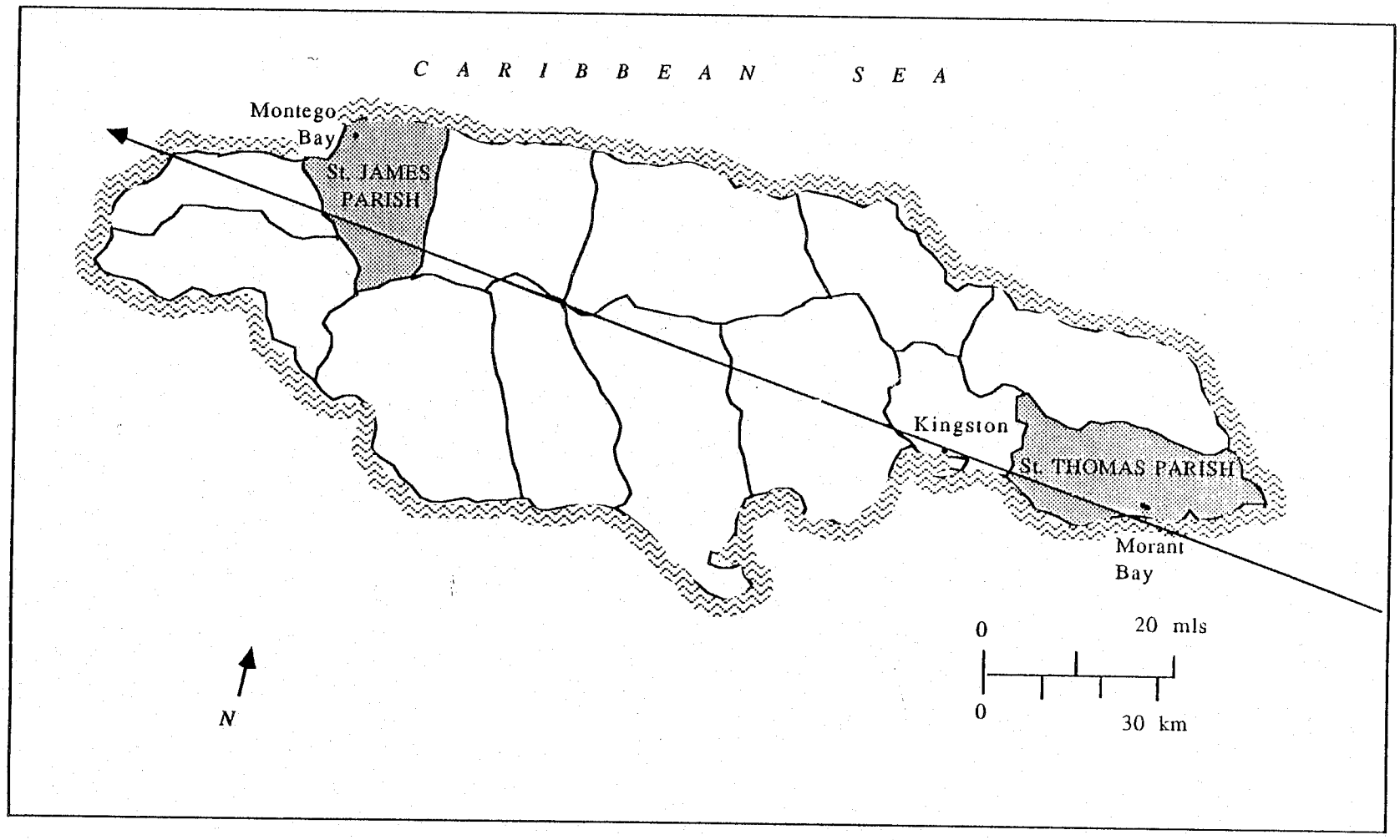

Figure 1. Map of Jamaica: Study Sites and Path of Hurricane Gilbert.

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 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.[1]

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, 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.

Household Characteristics and Damages

This section describes pre-disaster demographic and socioeconomic characteristics of households, and evidence on damage characteristics in the parishes of St. James and St. Thomas. These characteristics vary greatly and can have an important impact on household recovery responses to the

hurricane disaster. Characteristics used to describe household pre-disaster conditions include sex, education, marital status, housing type, income, and presence of insurance. A four-point scale of one the lowest and four the highest was used to depict level of damage to the household shelter.[2]

Table 1 shows that there were no significant differences between parishes for six of eight household characteristics, including sex, marital status, housing type, income,[3] insurance, and level of damage. However, education and age were significantly different ($p<.01$). Further analysis (Berke, et al. 1991) indicated that these characteristics were not significant factors in explaining modes of recovery activities, and mitigation and compliance decisions. 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.

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 population 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 status as they indicated that they had a legal lease 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

Table 1:
Characteristics of Respondents

	Percent		Chi Square Significance
	St. James	St. Thomas	
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
18-35	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)*			
Upper income	11.6	8.4	1.0
Upper middle/middle	28.1	26.9	n.s.
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 4

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

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 that 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.

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 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.

These findings were consistent with Cuffe's (1989) findings on damages by housing type. Even though the sample in Cuffe's survey was different than our sample, the general pattern of squatters suffering more damage than renters and owners was similar. A plausible explanation for this pattern of damages is that given the insecure land tenure status of squatters there is 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

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

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 Perceptions and Evaluations

Strategies

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 seeking assistance for making repairs and acquiring building materials.

The primary housing aid program of the Jamaican government was the Building Stamp Programme. Under this program, with financial support 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 local Hardware Merchants Association. Stamps were restricted to householders who owned homes and had legal title to the land. Thus all 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. For example, 39.7 percent of St. Thomas households received stamps valued at J$4,000 or more compared to 5.4 percent in St. James. The difference in percent receiving stamps and in value of stamps between each sample group is significant ($p<.001$).

We suspect that the major reason St. Thomas 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 program. The first phase of the program involving assessment of damages and household need was initiated in November 1988 (two months after Gilbert) in St. Thomas and in April 1989 (7 months after Gilbert) in St. James. We suspect that many households had initiated repairs in St. James before the Building Stamp Programme reached their homes. As a

Table 3:
Building Stamps

	Percent	
	St. James	St. Thomas
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

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 assessments.

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).

Even for households that received stamps, there were concerns in both parishes that the dollar value of the stamps was insufficient to undertake necessary repairs. Although our survey did not include questions on adequacy of value of stamps, interviews from previous fieldwork (Beatley and Berke 1990) with parish building officials and representatives of various community based NGOs revealed that this shortfall was partially attributed to problems associated with the damage assessment process undertaken by the Jamaica Defense Force (JDF). 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.

Another major problem with household rebuilding efforts was getting building materials to homesites. Indeed, 91 percent of the responding households from each parish indicated that they had difficulties with transporting materials (Chi Square = .002, df = 1, n.s.). In many cases individuals had to pay high transportation costs. One hardware store owner in St. Thomas estimated during an interview that van drivers were typically charging J$150 or J$200 to transport materials (Beatley and Berke 1990). 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. James, arranged for transportation and then deducted the cost of it from the building stamp.

Table 4 provides additional information on the problems caused by long delays in distributing stamps 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 ($p<.001$).

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.

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 (Haas, et al. 1977). Table 5 shows, however, that this was not the case for our samples in terms of seeking sources of material for rebuilding. The only formal source (purchased materials from a building supplier) was the most frequently used of the five sources listed on the table. 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.

However, in a more detailed analysis (Berke, et al. 1991) that controls for different theoretically relevant variables (e.g., damages sustained, socioeconomic status), we determined that squatters and renters were more likely not to use formal sources for acquiring building materials. As in the case of the Building Stamp Programme, squatters and renters typically did not

Table 4:
Number of Months Dislocated

	Percent	
	St. James	St. Thomas
When did you move back into your own house?		
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

Table 5:
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 house	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.

qualify for formal sources of housing aid. Without such aid and because these households had very limited financial resources to purchase materials, they were forced to fend for themselves or rely on family and friends for assistance.

After the hurricane there were numerous reports of shortages of construction materials throughout Jamaica. Table 6 shows that delays in making materials available were longer in St. James than in St. Thomas, with 47.7 percent in St. James indicating that materials only became available eight weeks or more after Hurricane Gilbert compared to 28.6 percent in St. Thomas. This difference is significant ($p<.001$). It is plausible that this delay can be attributed to the late arrival of the Building Stamp Programme and subsequent shipment of building materials to St. James.

Once building materials were acquired, it was then necessary to seek assistance for making permanent repairs. Table 7 shows that a formal source of assistance (hired a carpenter) was the most frequently used source for both survey groups, with 70.3 percent hiring a carpenter in St. James and 67.2 percent doing so in St. Thomas. This difference was not significant. The three informal sources of aid for making repairs (done yourself, help from family or friends, and volunteers from community) were each used by 13.5 percent or less of households in both survey groups. There were no significant differences between parishes for each of these sources.

Even those households that employed carpenters experienced considerable difficulties in finding knowledgeable and skilled workers. About one in four respondents in both samples (24.7 percent in St. James and 23.8 percent in St. Thomas) indicated that they had trouble finding a qualified carpenter. The difference between the parish samples was not significant. As will be discussed in more detail, because of the great number of damaged homes in both parishes, the high demand for carpenters made it difficult for some households to secure capable workers (CRDC 1990).

Another difficulty was that prices charged by carpenters went up, and in some instances the increase was dramatic. Table 8 shows that daily carpenter charges were significantly higher for respondents in St. James ($p<.001$), with 38.1 percent paying over J$200 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. Thomas. The

Table 6:
Availability of Building Materials

	Percent	
	St.James	St.Thomas
Number of weeks for materials to become available		
Less than one week	32.1	61.2
1-3 weeks	10.1	5.1
4-7 weeks	10.1	5.1
8-11 weeks	34.9	5.1
12 weeks or more	12.8	23.5
TOTALS	109	98

Chi Square	df	Significance
38.1	4	<.001

Table 7:
Making Repairs

	Percent		
	St. James	St. Thomas	Chi Square Significance
Hired a carpenter/builder	70.3	67.2	.3 n.s.
Done yourself	13.2	13.5	.003 n.s.
Help from family and friends	11.6	5.9	2.4 n.s.
Volunteers from community	2.5	.0	3.0 n.s.

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

underlying high level of pre-disaster competition for skilled labor in St. James, therefore, translated into higher disaster recovery charges.

While the costs of hiring carpenters were generally higher for St. James respondents, they were substantially higher compared to pre-disaster costs for some disaster stricken households in both parishes. 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 households 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 overcharging appear to corroborate with our survey findings. Indeed, the media indicated that in some instances carpenters overcharged by 200 percent or more (Daily Gleaner, December 19, 1988).

Perceptions and Evaluations

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 does not indicate a households' perceptions of the sufficiency of the aid. Indicators of household perceptions include perceived adequacy of insurance, evaluations of government and non-government organizational recovery efforts, and support of government efforts to promote mitigation initiatives.

Insurance played a major role in household responses to the demands for rebuilding. As indicated in table 1, a majority of households in both sample groups had insurance at the onset of the disaster. However, having insurance does not necessarily assure that the coverage is adequate or that households experienced no difficulties with insurance companies in obtaining benefits. Failure of disaster stricken households to have insurance or adequate coverage can severely constrain long-term rebuilding efforts.

Households with insurance were asked to evaluate the adequacy of settlements. Survey results indicate that a majority of responding households in both parishes had inadequate coverage. Specifically, 51.7 percent of St. James respondents with insurance and 52.0 percent in St. Thomas considered their insurance coverage as inadequate. This difference between survey groups was not significant (Chi Square = 1.5, df = 1, n.s.).

Households were also asked if they experienced difficulties with insurance companies in receiving payments. In St. James a majority (59.1 percent) and slightly less than half (44.1 percent) in St. Thomas indicated that they had difficulties. This difference was not significant (Chi Square = .001, df = 1, n.s.). An open-ended follow-up question asked households to specify the type of problems experienced with insurance companies. The most frequently cited problem, by about one-half of respondents from each sample group, was long delays of three months or more in receiving payments. Another frequently cited problem, by about one-quarter of the respondents from each group was their belief that they did not consider the settlement to be fair. Further five households in St. Thomas and three in St. James indicated that they settled too soon, as they were not able to obtain additional money from insurers when they discovered that their losses were higher than what was first estimated.

Respondents were also 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 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 and 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 a 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 (DRC 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 were 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.

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)

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 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 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. Thus, St. James would almost always benefit by its political affiliations with the central government in Kingston, and St. Thomas would suffer. Indeed, recall that the government's Building Stamp Programme started five months sooner in St. Thomas than in St. James, yet table 9 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.

Another interpretation might be that the St. Thomas population is rural, while St. James is more urban in character. Rural populations, 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 would tend to be less dependent and more suspicious of outside authorities' aid distribution efforts.

Respondents were asked to rate the effectiveness of each of 12 organizations' recovery responses in their parishes. Table 10 shows effectiveness ratings were higher for St. James respondents than for those in St. Thomas. This finding was expected given differences in political affiliation with the national government and in degree of urbanization. With the exception of two organizations (electric power companies and Jamaica Defense Force) the differences in effectiveness ratings between the two parish samples was significant ($p<.05$).

Table 10:
Effectiveness of Organizational Response

Organization	Percent			Chi Square Significance
	Highly Effective 1	Somewhat Effective 2	Not Effective 3	
Local Government				
St. James n=98	22.5	48.0	29.6	25.8
St.Thomas n=111	4.5	35.1	60.4	<.001
Red Cross				
St.James n=110	74.6	19.1	6.4	12.8
St. Thomas n=110	51.8	40.0	8.2	<.01
Salvation Army				
St. James n=110	77.3	14.6	8.2	55.9
St.Thomas n=99	26.3	57.6	16.2	<.001
Electric Power Co.				
St. James n=119	80.7	16.8	2.5	n.a.
St.Thomas n=116	75.0	21.6	3.5	n.a.
Telephone Company				
St. James n=112	59.8	33.0	7.1	7.5
St. Thomas n=99	41.4	45.5	13.1	<.05
Ministry of Housing				
St.James n=73	13.7	34.3	52.1	25.1
St. Thomas n=90	1.1	12.2	86.7	<.001
Ministry of Agriculture				
St. James n=59	23.7	39.0	37.3	12.9
St Thomas n=92	4.4	46.7	48.9	<.01
Office of Disaster Preparedness				
St. James n=101	68.3	27.7	4.0	31.4
St. Thomas n=114	32.5	45.6	21.9	<.001
Jamaica Defense Force				
St. James n=105	66.7	27.6	5.7	.6
St. Thomas n=115	61.7	31.3	7.0	n.s.
Ministry of Social Security				
St. James n=98	30.6	41.8	27.6	3.6
St. Thomas n=118	26.3	54.2	19.5	n.s.

Table 10:
Effectiveness of Organizational Response
(continued)

Organization	Percent			Chi Square Significance
	Highly Effective 1	Somewhat Effective 2	Not Effective 3	
Police				
St. James n=97	36.1	49.5	14.4	7.0
St. Thomas n=111	19.8	60.4	19.8	<.05
Local Volunteer Organizations				
St. James n=84	53.6	37.0	9.5	6.6
St. Thomas n=111	35.1	52.3	12.6	<.05

Organizations that had the highest effectiveness ratings were non-governmental organizations, followed by government organizations. Specifically, a majority of respondents from each parish indicated that two non-governmental organizations (Red Cross and electric power companies) and the Jamaica Defense Force were highly effective. Three non-governmental organizations (Salvation Army, telephone companies, and local volunteer groups) and the Office of Disaster Preparedness were rated highly effective by a majority of St. James respondents.

Table 11 illustrates results from a series of questions on attitudes about the need for mitigation measures. Specifically, respondents were asked about the extent to which they agreed or disagreed with four statements. The statement involving residents' responsibility for mitigation received wide support, with over 95 percent of the respondents from both parishes indicating that they strongly or somewhat agree. Questions were also asked about attitudes towards government responsibility in reducing loss from hurricanes. Similar to the response on resident responsibility, attitudes toward government responsibility for limiting construction in hazardous areas and enforcing building codes were highly supportive, with almost 100 percent of respondents from both parishes indicating that they strongly or somewhat agree. The differences between all these responses from each parish were not significant.

On the final statement about government having undertaken sufficient mitigation actions for reducing potential loss to future hurricanes, the responses were not supportive. That is, 76.8 percent of St. James respondents and 79.2 percent from St. Thomas strongly disagreed or somewhat disagreed. This difference was not significant. Thus, respondents from both parishes were in agreement that government has not done enough to mitigate potential loss.

Mitigation Actions and Compliance to Building Stamp Programme

This section presents evidence on household mitigation and compliance responses. The survey included two sets of questions which asked about household mitigation practices used during rebuilding, and compliance with government guidelines in using building stamps.

Table 12 indicates that a majority of responding households from both parishes did not undertake mitigation actions during rebuilding. However, a

Table 11:
Support of Government Efforts To Mitigate

Responsibility of Mitigation	Percent				Chi Square Significance
	Strongly Agree 1	Somewhat Agree 2	Somewhat Agree 3	Strongly Disagree 4	
Residents Have Responsibility of Mitigation					
St. James n=119	83.2	13.5	2.5	.8	n.a.
St. Thomas n=119	84.0	11.8	.8	3.4	n.a.
Government Should Limit Construction in Hazardous Areas					
St. James n=121	95.9	4.1	.0	.0	n.a.
St. Thomas n=119	91.6	7.6	.8	.0	n.a.
Government Should Enforce Building Codes to Ensure Mitigation					
St. James n=120	92.5	7.5	.0	.0	2.9
St. Thomas n=118	85.6	14.4	.0	.0	n.s.
Government Has Mitigated Sufficiently For Future Hurricanes					
St. James n=117	10.3	17.1	28.2	48.6	3.3
St. Thomas n=108	5.6	14.8	27.8	51.4	n.s.

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

Table 12:
Recovery Decisions

Mitigation measures per household	Percent St. James	Percent St. Thomas
No mitigation measures taken	58.7	71.4
One mitigation measure per household	41.3	28.6
TOTALS	121	119
	Chi Square 4.3	df 1 / Significance <.05
Compliance Decisions of Those Receiving Building Stamps		
Traded for cash	.0	5.9
Traded for goods other than building supplies	2.7	22.1
Traded for building supplies	97.3	72.0
TOTALS	37	68
	Chi Square n.a.	df n.a. / Significance n.a.

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

greater proportion of St. James respondents (41.3 percent) undertook one or more mitigation actions compared to those of St. Thomas (28.6 percent). This difference was significant ($p<.05$). In addition, a follow-up open ended question asked those households that undertook mitigation actions to specify the type of measures used. The most frequently cited measures (25 percent or more from each parish) were hurricane straps and thicker gauge zinc roofing. A small percentage of households (10 percent or less from each parish) indicated that they installed anchoring systems, erected concrete roofs and walls, and relocated their homesites from high to low risk areas.

There are several plausible explanations for the limited mitigation activity in both parishes. One was that most of the rebuilding effort occurred in the informal sector, which comprises about 70 percent of all construction in Jamaica (CRDC 1990). Within this sector, it is likely that new construction and reconstruction is largely undertaken by individual homeowners or carpenters who give little attention to formal codes and do not obtain building permits, even when they are supposed to obtain them. Construction in the informal sector appears more influenced by what the prevailing building practices are, and the need to minimize construction and repair costs. Most reconstruction generally was based on traditional "rules of thumb," rather than a building code.

A second explanation was, as discussed, difficulties in finding qualified carpenters. It is likely that in response to the dramatic rise in demand for carpenters, many workers, who may have been laid off from other jobs following the storm, entered the carpentry market. Overnight many people who likely had minimal skills began to sell their carpentry services as "carpenters" (CRDC 1990). Interviews from previous fieldwork (Beatley and Berke 1990) revealed that these people were often referred to as "hurricane tradesmen," with little formal training and knowledge of building codes.

A third explanation for limited mitigation in both parishes was that even if attempts were made to adhere to codes, they still played a limited role in reconstruction for several reasons. First, jurisdiction for the code does not extend over the entire parish; rather it applies only in the major cities, and within one mile of the coastline. Second, under the code provisions reconstruction did not require a building permit if the owner intended only to restore or replace the building to what was there prior to the hurricane. Third, the staff available to enforce the code in each parish was insufficient,

as there was only one part-time inspector in St. Thomas and two fulltime inspectors in St. James.

Because our survey findings indicated that St. James respondents experienced longer delays in obtaining building stamps and supplies, and in relocating back to original homesites, we expected that they would be less likely to undertake substantial repairs because of lack of timely assistance. However, as discussed, such expectations were not confirmed as a greater proportion of St. James respondents incorporated mitigation actions into rebuilding. An interpretation of this finding is that St. Thomas respondents tend to question and challenge motives and commitments of the government towards long term recovery more than St. James respondents. Recall that St. James is politically aligned with the national party in power, and St. Thomas is primarily represented by the opposition party. One notable observer (Stone 1989) maintains that opposition party members in Jamaica have over the past decade increasingly built up cynicism, political distrust of leaders, and alienation towards the government. Thus, St. Thomas residents would be less likely to support any government backed programs, which might include mitigation. They may also be more accustomed to coping with continual uncertainties, and have higher confidence in their ability to adjust to unstable social settings, such as disaster recovery periods (Moore 1964). They would thus be more acclimated to uncertainty, and less likely to consider undertaking mitigation actions. Moreover, because of its rural character, local politics in St. Thomas tend to be more parochial and locally centered than in St. James and thus St. Thomas respondents are less likely to react positively to national concerns over reducing risk from future hurricanes.

Findings on compliance to use building stamps for their intended purposes also were consistent with findings on the distinction in mitigation responses between survey groups. Table 12 indicates that while a majority of respondents who received stamps complied by trading them to building suppliers for materials, there is a substantial difference in compliance rates between parishes. That is, almost all St. James respondents (97.3 percent) complied, but 72 percent from St. Thomas did not. 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. These findings on St. James compliance appear to be consistent with the findings of an Urban Development Corporation (UDC 1990) sponsored study of households receiving building stamps. The UDC undertook a 10 percent sample of all stamp recipients in St. James and found that less than 5 percent of those sampled used the stamps for unintended purposes.

We suspect that the reasons for the differences in compliance between the survey groups, are similar to the reasons for differences in mitigation. As mentioned, we maintain that St. Thomas respondents are less likely to comply because they are more alienated towards government and less likely to react positively to Building Stamp Programme guidelines than St. James respondents.

Interviews with parish and other officials (Berke and Beatley 1990) also revealed numerous ways on how 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 stamp for J$6,000, 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 also 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. And, of course, 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.

As discussed, in some cases the building supply stores 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. As a result of the need to provide the stampholder with a cash allowance for transportation, many public officials believed this shortcoming served to open up the program to even greater abuses, particularly regarding the "cashing-in" of stamps. 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.

Conclusions and Recommendations

This study offers some significant lessons for the design and implementation of post-disaster recovery programs in Jamaica. It also should be of use in the development of disaster recovery planning programs in countries that have not recently experienced a disastrous event.

Conclusions

1. Squatters suffered more damages to their homes than renters and owners in both parish survey groups. Given the insecure land tenure status of squatters, there is little incentive in building and maintaining well constructed housing. Squatters, in particular, and low income households generally, tend to build homes that are not securely anchored to foundations, and are constructed with flimsy zinc roofing and low-grade wooden siding and flooring.

2. A significantly greater proportion of responding households in St. Thomas received a building stamp compared to the St. James sample. Similarly, the value of stamps was significantly higher for respondents in St. Thomas. This disparity between sample groups was likely due to the stamps being distributed five months later n St. James than in St. Thomas. As a result, St. James 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 assessments.

3. There were widespread concerns in both parishes that the dollar value of the stamps was not sufficient to undertake necessary repairs. Such undervaluations were commonly attributed to problems with damage assessments by the Jamaica Defense Force (JDF). The assessments were characterized as quick and crude, and the assessors were considered to have inadequate knowledge of localized construction and repair practices.

4. A major problem constraining household recovery was transporting building materials to homesites. Over 90 percent of the respondents from each parish indicated that they had difficulties with transporting materials. The Building Stamp Programme contributed to this problem as it did not account for transporting materials to homesites.

5. The long delays in distributing building stamps caused, in part, a substantial proportion (40 percent) of responding households in St. James to temporarily relocate from their homesites for seven months or more, compared to a small proportion (3.5 percent) in St. Thomas. However, we suspect that this problem might not be crucial for Jamaicans. That is, there is a severe housing shortage in St. James, and in Jamaica in general, and people are quite resourceful in seeking housing on a daily basis under difficult conditions. They are also accustomed to helping out friends and relatives in times of need. Thus, even with the substantial proportion of responding households being forced from their homes in St. James, we suspect that problems with dislocation were not as severe for Jamaicans as they might be for other societies like Canada or the United States.

   Another problem attributed to delays in distributing building stamps in St. James were delays in making materials available for long-term rebuilding. Nearly one-half (47 percent) of St. James responding households had to wait eight weeks or more for materials, compared to only 28.6 percent in St. Thomas.

6. Respondents in both parishes were more likely to use formal sources of assistance than informal ones in seeking materials for rebuilding. A much greater proportion of respondents from each parish obtained materials from building supply stores, which are considered a formal source, compared to informal sources, such as salvaging materials from previous homes or surrounding neighborhoods, trading for materials, and receiving donations from family and friends.

7. A much greater proportion of respondents in each parish (67.2 percent or more) hired a carpenter for making permanent repairs, compared to 13.5 percent or less that used different types of informal assistance (making repairs themselves, or seeking assistance from family, friends or volunteers). However, about one-quarter of respondents from each parish experienced difficulties in finding qualified carpenters due to a dramatic increase in demand for carpentry services after the disaster. Reflecting this increased demand were the substantially higher prices charged by carpenters. Indeed, 41 percent of respondents in St. James and 33.9 percent in St. Thomas believed that they were taken advantage of and paid more than they should have.

8. There is a diversity between parish survey groups in evaluations of how well the Jamaican government handled a wide variety of recovery issues. While survey results indicate that both parish groups were generally more negative than positive in their assessment of the overall government recovery effort, St. James respondents gave the government higher ratings in handling recovery issues. A partial explanation of this finding was that St. James Parish was aligned with the opposition party. Thus given the widespread and deeply rooted system of political patronage in Jamaican politics, it is likely that no

matter what the aid allocations were, the party status of the parish led respondents to believe that politics were involved in all aid distribution decisions.

Another explanation would be that the St. James population is urban in character, while St. Thomas is rural. Because of the tendency of rural people to be more isolated and self-reliant in undertaking recovery activities than urban inhabitants, it is likely that St. Thomas residents would be more suspicious and less dependent on outside authorities.

9. There is also considerable diversity between parish survey groups in evaluations of the effectiveness of various organizations' recovery responses. That is, St. James respondents gave higher effectiveness ratings than St. Thomas ratings. Again, this finding was expected given differences in political affiliation with the national government and in degree of urbanization.

In addition, both survey groups gave higher effectiveness ratings to non-governmental organizations, in contrast to governmental organizations.

10. Of those respondents who were insured, slightly more than one-half from both survey groups indicated that they did not have adequate insurance to cover all damages. Further, 59.1 percent of St. James respondents with insurance and 44.1 percent from St. Thomas had difficulties in receiving payments, with delays of three months or more in receiving payments being the most frequent complaint.

11. Respondents from both survey groups were highly supportive (95 percent or more) of residents taking responsibility for mitigation, and for government taking action to limit construction and enforce building codes to ensure mitigation in hazardous areas. However, about three-fourths of the respondents from both groups were in agreement that government has not done enough to improve mitigation efforts in Jamaica to reduce potential loss from future hurricanes.

12. A majority of responding households in both parishes did not undertake mitigation actions during rebuilding. There are several potential explanations for the limited mitigation activity in both parishes. One was because most rebuilding occurred in the informal sector of the Jamaican economy where reconstruction is largely undertaken by individual homeowners and carpenters who give little attention to formal building codes. Other explanations were difficulties in finding qualified carpenters who were familiar with structural strengthening techniques, and inadequate building code standards.

13. There was widespread belief that squatters and renters were more likely not to mitigate during rebuilding (CRDC 1990). Our data, however, revealed that being a squatter or renter was not indicative of whether a household undertook mitigation action. Instead, being a respondent from St. James Parish was a strong positive indicator of mitigation action.

14. Because of delays in obtaining building stamps and supplies, we expected that St. James respondents would be less likely to undertake

substantial repairs because of lack of timely assistance. Contrary to our expectations, a significantly greater proportion of St. James respondents (41.3 percent) undertook mitigation during rebuilding, compared to respondents in St. Thomas (28.6 percent). An explanation of this distinction is that because St. Thomas Parish respondents are more likely to be politically alienated towards government than respondents in St. James Parish, they would be less apt to react positively and support any government backed programs involving reducing risk from future hurricanes. They may also be more accustomed to coping with uncertainty, and have higher confidence in their ability to adapt to unstable social settings, such as disaster recovery periods, and thus not be inclined to undertake mitigation actions.

15. Similar to findings on differences in mitigation effort between parish groups, there is considerable diversity between survey groups in how respondents used building stamps. Specifically, there is a significantly greater proportion of St. James respondents (97.3 percent) using building stamps as prescribed by the Jamaican government, compared to respondents from St. Thomas (72 percent). We suspect that the reasons for the differences in compliance are similar to the reasons for differences in mitigation effort (see conclusion #14) between the survey groups.

16. Interview data revealed that for some building stamp recipients it was more important to trade them in for cash or household goods than to repair their homes to pre-disaster conditions. As long as they made adequate repairs, like keeping the roof from leaking, priority was given to meeting more basic and immediate household needs, such as mattresses and eating utensils.

Recommendations

The recommendations offered here provide a starting point for improving the recovery planning program in Jamaica. They also serve as a strategy for achieving a more sustainable society. The strategy recognizes that recovery, hazard mitigation, and long-term sustainable development are interrelated activities. All these activities require planning, depend on similar information bases, and should be considered in recovery programs. The strategy also maintains that actions needed to be taken must be mutually supported, with no single group -- whether government, NGOs or citizens -- acting alone. While the following recommendations provide broad strategic directions, specific recovery activities and priorities need to be worked out for Jamaica:

1. Recognize that the national government should be involved in distributing large scale disaster assistance, and that the JDF damage assessment procedure and the Building Stamp Programme were about the only ways a large nationwide housing recovery aid effort could be organized. There are, however, several aspects of the programs that could be improved, particularly associated with disaster aid being largely funneled through a centralized, bureaucratic and highly politicized national government.

2. Develop a damage assessment and building supply distribution system which bypasses political allegiances by finding, where possible, non-governmental and thus politically-neutral means of distribution of disaster recovery aid. This action might involve the creation of politically independent parish and community level organizations (i.e., Disaster Recovery Task Forces) which could swiftly and objectively help assess damages and distribute disaster assistance. These organizations should heavily rely on well established field networks of NGOs and work in consultation with local government officials. Task Force participants would thus have an intimate understanding of the circumstances of residents and would be more impartial in allocating benefits, compared to national government agency staff.

3. Formally designate local Disaster Recovery Task Forces to assist in damage assessment and aid distribution, and to give overall direction to long-term recovery. Actions needed to establish this type of organization are to specify: sphere of responsibility during pre- and post-disaster periods; membership; procedures for activating the organization; and responsibilities of each member.

4. The Disaster Recovery Task Force should also prepare disaster recovery plans to guide future disaster activities at the localized level. The plans should build on lessons learned from Hurricane Gilbert recovery experiences.

5. Domestic and international housing aid programs should rely on local people and leadership whenever possible. Such reliance can facilitate long-term recovery and can improve the chances for increasing local commitment and a sense of ownership of recovery planning and risk reduction initiatives. These programs should emphasize building up human skills, like carpentry, and not solely rely on physical and material assistance.

6. Build in more flexibility in the Building Stamp Programme to allow recipients to use stamps to purchase a wide variety of materials that are suitable to their specific recovery needs.

7. Temporary repairs, particularly when disaster stricken households must wait for six months or more for assistance, should not disqualify households for recovery assistance. Disaster recovery programs should be designed to encourage self-initiative and not discourage it.

8. Set up a continuous system for monitoring building supply store transactions in transferring supplies to aid recipients to ensure that they follow program procedures.

9. Impose the threat of certain penalties to be imposed on aid recipients and building supply store owners if abuses are detected.

10. Educate building supply store owners about the Building Stamp Programme, and other related recovery programs that might involve supply stores, to ensure that owners understand program procedures.

11. Provide for transport of building materials as part of the Building Stamp Programme, especially for those disaster stricken households with limited resources to either pay or arrange for transportation.

12. Need and not secure land tenure should be a requirement for qualifying for long-term housing recovery aid. A national housing aid program should, therefore, be designed to account for the range of land tenure patterns.

13. Increase budget and staff of the lead Jamaican disaster recovery organization (Office of Disaster Preparedness) to strengthen its involvement at the parish and community level in enhancing local capacity to undertake disaster recovery planning.

14. Private insurance companies should regularly notify their customers on a monthly billing statement, or some other means, to check whether their hazard insurance covers the full value of their property. Because property values continuously change, it is crucial that homeowners purchase coverage that is not under or over valued.

15. Establish a public information program with communications aimed at reaching all social groups at risk. Special attention should be given to low income groups with no secure land tenure status, and to rural people who are isolated and tend to distrust government initiatives. The program should relate national and international risk reduction concerns to local situations, and should cover: information about hurricanes and their effects on Jamaica; updates on programs and plans for recovery information for homeowners and businesses which describes assistance programs and "how to" instructions for repair; continuous progress reports on major recovery problems and responses to such problems.

16. Review existing building codes and compliance procedures for adequacy in relation to hurricane forces to assure safety. This step requires the updating of the Caribbean Uniform Building Code, particularly for small buildings, and the hiring of additional inspection staff. Such staff, however, should not be viewed as "enforcers" of the code, but as extension specialists who act as promotes and trainers of appropriate building construction practices. Further the code should not be viewed as "regulations," but as a guide for providing sound construction practices.

17. Define areas where new building construction should be prohibited or subject to special requirements to assure safety.

NOTES

1. 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.

2. 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 the buildintg damage categories used for determining eligibility to the government Building Stamp Programme.

3. 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 extimate for households the Wint and Piersenne occupation classification scheme for the Jamaican population was used.

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