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TOOL KIT

A MANUAL FOR IMPLEMENTATION

OF THE

HURRICANE RESISTANT HOME IMPROVEMENT PROGRAM

IN THE CARIBBEAN

PREPARED BY THE COOPERATIVE HOUSING FOUNDATION
AND
PRESENTED TO THE ORGANIZATION OF AMERICAN STATES

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PRODUCED WITH RESOURCES PROVIDED BY THE U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT UNDER THE CARIBBEAN DISASTER MITIGATION PROGRAM

I. Introduction

In 1994, the Organization of American States' Office of Regional Development and Environment contracted the Cooperative Housing Foundation (CHF) to assist in the implementation of two housing retrofit programs (hereinafter referred to as the Safer Construction Program) in St Lucia and in Dominica. The Safer Construction Program, one of six Caribbean Disaster Mitigation Program (CDMP) program areas is funded by the United States Agency for International Development (USAID) and is implemented throughout the Caribbean by the Organization of American States (OAS). The Program has been operational for two years, and has improved the hurricane resistance of 60 houses and the training of 150 artisans in three Eastern Caribbean countries.

The Safer Construction Program was designed and implemented to promote the concept of pre-disaster *mitigation* in the homes of low-income families. In the Caribbean, institutional responses to hurricanes (particularly housing-related responses) have traditionally addressed damages reactively—after roofs have been lifted off, walls toppled, and foundations destroyed Retrofitting for hurricane resistance involves the upgrading of existing structures to reduce the vulnerability of key components *before* damage can occur. With technical and managerial assistance from CHF and under the OAS' supervision, local NGOs design and implement outreach and publicity campaigns, conduct hurricane resistance construction and retrofit training courses and set up loan funds to assist low-income earning families in strengthening their existing homes

The Safer Construction Project (recently renamed Hurricane Resistant Home Improvement Program) was originally implemented in St. Lucia and in Dominica. In St. Lucia, CARITAS (the lead implementing agency), the National Research and Development Foundation (NRDF) and the Sir Arthur Lewis Community College (SALCC) were selected by the OAS and CHF to manage the various components of the Program In Dominica, the Program was implemented by the National Development Foundation of Dominica (NDFD) with technical assistance from the Safe Shelter Initiative.

The timing for the full launch of the pilot activities of the Safer Construction Program coincided with the busiest hurricane season in the Caribbean since 1933. Indeed, the destruction brought by hurricanes Luis and Marilyn in Dominica between the period of August 27 to September 18, 1995 served as an ominous reminder of the urgent need for housing mitigation activities in the region

The high winds, storm surge and flooding caused damage or loss to 876 housing units Most of the properties destroyed or damaged were small wooden structures belonging to low-income families These structures, for the most part, did not meet local building codes requirements and

nearly all sustained damage to roof elements. A total of 124 units were estimated as having been destroyed and the total loss to the housing sector is estimated at $4.265 mn [1]

In dramatic contrast to what was happening throughout the island, all houses retrofitted through the Safer Construction Program in the Carib Reserve of Dominica successfully withstood the winds wielded by the successive hurricanes—in fact, one house retrofitted with funds from the Program served as a community shelter in the Carib Reserve during the passage of Hurricane Luis

The following technical portions of this Toolkit provide descriptions and guidelines necessary for the implementation of a successful home improvement and hurricane resistant retrofit program. Special thanks go to all our partners in USAID, the OAS and the following Caribbean organizations for their assistance in piloting this program and the provision of the materials included in this manual:

CARITAS Regional Office
National Development Foundation of Dominica
National Research and Development Foundation, St Lucia
Safe Shelter Initiative, Dominica
Sir Arthur Lewis Community College

Special thanks are also extended to Barclay's Bank of St. Lucia for their pioneer private sector contribution to the program.

This Toolkit is divided into the following key sections for the convenient use of any person or organization desiring to implement a program of constructing, improving or retrofitting homes to be hurricane resistant in the Caribbean setting:

- *Program Description* This section provides an overview of the program's main components as implemented under the CDMP
- *Management Structures.* This section discusses the roles and responsibilities of key partners in the implementation of a successful safer housing campaign.
- *Hurricane Resistant Home Improvement Basics.* This section describes the basic tenets of the retrofit technique as implemented in the Caribbean under the CDMP.
- *Loan Program.* This section describes the home improvement lending methodology recommended for the implementation of successful safer housing initiatives in the Caribbean.

[1] *Summary of Impact of Hurricane Luis on CDERA Participating States: Response Actions, Recovery and Rehabilitation Needs* Caribbean Disaster Emergency Response Agency (CDERA). Barbados, 1995.

- *Outreach/Awareness/Marketing.* This section provides an overview of steps to insure that targeted populations become aware of and take full advantage of the Program.

- *Monitoring and Evaluation.*

- *Training Builders.* This section provides an overview of the training strategies implemented by the CDMP during the course of the Program.

- *Appendices.* This section includes the "tools" implementing organizations may use in the operation of a Hurricane Resistant Home Improvement Program in the Caribbean

The techniques and concepts included in this manual are the result of several years of pilot programs and earlier research efforts conducted in Jamaica and elsewhere As the program continues to grow and new or better methods are developed this Toolkit will be revised and updated to include the latest best practices. CHF invites any readers with suggested improvements to forward them to our offices in Silver Spring, Maryland for inclusion in the next edition.

N.B.

While there is a wide range of construction, land arrangement, drainage and wind break techniques that can be used to protect homes in hurricane prone conditions, the techniques included in this manual were selected for their importance, modest cost and availability to every family.

It is critical that people throughout the Caribbean be made aware their homes no longer need be vulnerable to routine hurricanes. Techniques and technology exist and are available at modest cost, which can make their homes resistant to Class I, II & III hurricanes (winds up to 130 mph). These techniques should become a standard part of all new construction and remodeling, upgrading and/or rehabilitation of homes throughout the Caribbean.

Class I & II hurricanes strike most Caribbean countries on the average of every eight years. Class III hurricanes strike on the average of every twenty years. Class IV hurricanes (131 to 150 mph) average once in a century and not much can be done to resist this freak of nature. Classes I - III storms need no longer threaten the homes of residents in the Caribbean countries.

II. Program Description

In each country where it is implemented, the Hurricane Resistant Home Improvement Program includes the following activities:

- A home improvement and hurricane resistance retrofit campaign targeted to moderate and low-income families;
- A national publicity and community outreach program to make people aware that homes and buildings can be made hurricane resistant at modest cost, either during new construction, remodeling or retrofitting,
- A program of training for construction workers, contractors, craftsmen and families interested in home construction.
- A loan program designed to assist low-income families in financing basic home improvements which include the hurricane resistance components.

The home improvement and retrofitting process focuses primarily on protecting the roof structure on the house In a hurricane the roof is the most vulnerable and plays a critical role is holding together the rest of the structure. The technology used is simple and incorporates time-tested construction techniques:

- Reinforcing all joints and connections (at the ridge board, between the joists and the top plate, between the floor and the foundation, at the foundation footing);
- Using long, strong, wide headed screws or nails,
- Installing strong roofing material;
- Attaching hurricane straps on the rafters, joists and wall plates.

The installation of hurricane straps is the most essential component of strengthening a house to resist hurricane forces. The strap consists of a short piece of flat metal that can be used to secure roof joists to the top of wooden or cement walls. The strap, which can be purchased inexpensively in most hardware stores in the region, is key in ensuring that the roof structure remains intact when hurricane-force winds are blowing Another improvement is the use of long drive screws or of wide-headed nails (at least two inches in length) to affix the corrugated metal commonly used for roofing. Strong screws or nails help hold the roof in place, while common nails often rip through roofing sheets during hurricanes. Other improvements that help prevent roof-related damages include: enclosing the roof overhang around the house with the addition of a soffit and of fascia boards, reducing the roof overhang (maximum 18"), increasing the roof pitch (22° minimum) and installing window storm shutters.

The revolving loan fund is made available to families earning less than the median income for the country and living in sub-standard homes which are at significant risk with the coming of each hurricane season. Credit is made available to individuals and families for general home improvements which must include hurricane resistance techniques and/or for hurricane resistance retrofitting specifically. Under the CDMP, the amount of the loan to beneficiaries has not exceeded EC$6,000, and the targeted average loan is currently EC$3,000 Monthly loan payments must not exceed 25% of household monthly income

Residents in targeted project areas who satisfy the criteria established by the lead implementing agency (LIA) obtain low interest loans to undertake the necessary retrofit activities either through contracted services or through self-help provided the workers are properly training The initial loan capital is provided to the LIAs by the Cooperative Housing Foundation to activate the process of loan disbursement and recovery. Implementing agencies are expected to obtain additional funds from local public and private sector agencies. These funds can be raised either as grants or as low-interest loans. During the Fall of 1996, CHF began the process of fund-raising in the United States to increase the value of the retrofit loan fund. A more detailed description of the loan program is included in Chapter V

Under the Program, a training component is developed to instruct local workers in hurricane resistance home construction and retrofitting techniques. A qualified training agency or individual is selected to conduct the sessions. The lead trainer should be a qualified builder, architect, engineer or teacher with expertise in the specific area. **The instruction provided must include practical sessions which enable trainees to actually practice the various techniques utilized during the retrofitting process**. Training courses have typically included the retrofitting of an existing structure to provide a demonstration model and give the trainees tangible, hands-on experience

The training goal is to prepare a maximum number of artisans/crafts persons to analyze the hurricane resistant weaknesses of an existing home, draw a working plan to include improvements and retrofitting that will meet minimum standards of hurricane resistance, prepare a cost estimate and undertake the standard retrofitting work Estimators and project technical officers should participate in the training to insure that all segments of the program are using the same information, standards and techniques.

To the extent possible, the training program should also provide community residents with a demonstration "model home" and should instill a basic understanding of safer construction techniques. Finally, to ensure the dissemination of proper hurricane resistant construction and retrofitting techniques, the Program should seek to institutionalize such training into existing construction curricula at technical schools, community colleges and construction seminars.

III. Management Structures

USAID's former Regional Housing and Urban Development Office for the Caribbean (RHUDO-CAR)[2] and the OAS have provided the overall supervision for the Program. The Cooperative Housing Foundation, under contract from the OAS, provides managerial and technical support In St. Lucia, CHF works in collaboration with CARITAS, NRDF and SALCC. In Dominica, the local partners are the National Development Foundation of Dominica (NDFD) and the Safe Shelter Initiative (SSI). In 1997 the National Development Foundation of Antigua & Barbuda is expected to become an LIA for that country.

A. Roles of Collaborating Institutions

In each participating country, the OAS and CHF seek to identify agencies with experience in at least one of the following substantive areas:

1. Loan Administration;
2. Project Management;
3. Construction, including experience in the provision of low cost shelters;
4. Construction Training.

While it is unlikely than any one agency will possess all of the necessary skills, it is critical that the lead implementing agency (LIA) have strong management expertise, as the LIA will coordinate the activities of the other implementing agencies. The LIA will most likely enter into a contractual arrangement with the support agencies to undertake specific tasks such as publicity, training, and supervision of the construction site.

In undertaking the implementation of the Program the LIA is also advised to solicit the active participation of other supporting institutions/sectors. These include:

1. The National Disaster Office;
2. The Financial Sector;
3. Building Supply Merchants;
4. Builders/Contractors;
5. Community Leaders;
6. Television, radio and newsprint.
7. Community organizations such as credit unions, cooperatives and other NGOs;
8. Vocational schools, community colleges or other instructional centers.

[2] The Caribbean Regional Program (CRP) of USAID Kingston currently manages the Project for USAID.

The overall management structure for the Program is as follows:

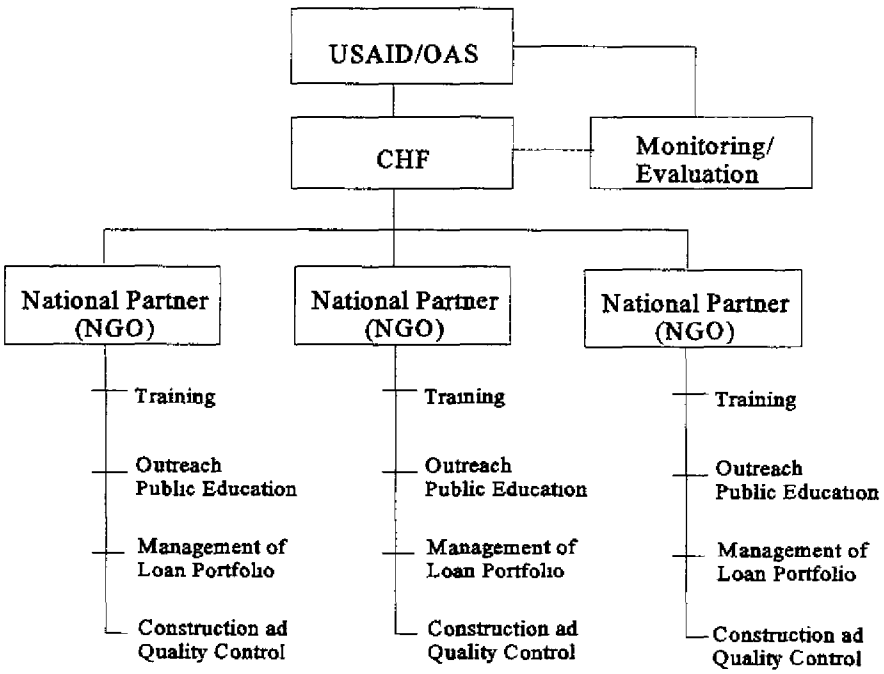


Figure 1

A1. Organization of American States (OAS)

The OAS was selected by USAID to implement the Program on the basis of the OAS' long established presence in the Caribbean and of its track record in administering development assistance and disaster-related programs. The OAS' Unit of Sustainable Development and Environment (formerly Department of Regional Development and Environment) has been responsible for providing management oversight for all aspects of Program implementation.

A2. Cooperative Housing Foundation (CHF)

Under contract with the OAS, CHF provides technical assistance to the Lead Implementing Agencies and monitors the project, through both visits and regular correspondence All project documentation, including milestone reports and credit reports are consolidated by the LIAs and submitted to CHF. Payments to the LIAs and to any other implementing agencies are made by the OAS after CHF has had the opportunity to review the required documentation and has signified its concurrence to the OAS. Under separate agreement with the LIAs, CHF may make a direct financial concessionary loan to the revolving loan fund for the Home Improvement and Hurricane Resistance Program.

A3. Lead Implementing Agency (LIA)

Under the contract with the OAS, the LIAs (with support from CHF) are responsible for: preparing and conducting the training sessions; conducting outreach/public education; managing the loan fund, and implementing the home improvement and retrofit campaign Specifically the LIAs carry out the following tasks·

Design and conduct national awareness and public education campaigns,
Design and conduct surveys of potential participant communities,
Conduct credit studies on the feasibility of loan programs for housing retrofit purposes;
Conduct technical studies,
Arrange training programs;
Develop and log loan approval procedures and criteria;
Administer reflows from the project's revolving loan fund;
Contract and supervise a building estimator/inspector to estimate retrofitting costs and to verify work implementation;
Provide transportation and logistical support;
Promote and network with national and international donors to increase the value of the revolving loan fund;
Prepare periodic progress reports and consolidate information from subcontractors and other implementing parties;
Prepare quarterly credit reports for submission to CHF.

B. Project Implementation

The project is typically implemented in three phases: (1) project design studies and start-up; (2) community outreach, and (3) household sign-up and retrofit.

1. Project Design Studies and Start-up
   - *Survey of potential participants.* Household characteristics, community interests and needs, housing stock quality.
   - *Retrofit study.* Cost-effectiveness study, retrofit guidelines, skills training needs.
   - *Training of building artisans and community members.* Determination of current skills, preparation of training materials, design of training programs.
   - *Public education and awareness.*

2. Community Outreach

   - *Selection of target communities.* Outreach and community mobilization, awareness campaign.
   - *Training of artisans and community members.* Selection of artisans, organization of training sessions.

- *Training of participant households.* Selection of households, organization of training sessions

3. Household Sign-up and Construction

   - *Household sign-up.*
   - *Loan approval.* Cost/work estimate, approval of loan package.
   - *Construction/Retrofit.* Selection of contractor, retrofit completion and inspection.

C. Household Sign-up and Retrofit

Under the Hurricane Resistant Home Improvement Program the construction/retrofit process is implemented in 13 different phases. As a guide to potential LIAs a breakdown of these phases is provided as follows

1 *Household becomes aware of retrofit program.* Public education and outreach programs have been designed to inform *low-income* earning households Outreach efforts should be focused and targeted toward households where the demand exists for small retrofit or home improvement loans.

2. *Household contacts LIA.*

3. *Estimator develops baseline data on household.* During the initial phase of the project, the Estimator may work under the supervision of the LIA In the long run, the services of the Estimator should be included in the retrofit costs

4 *Estimator prepares cost estimate, materials list and instructions for builders using the Minimum Standards Checklist* This is a crucial phase of the loan making process. The Estimator is, in effect, preparing a financial and technical work plan which must be respected by the contractor

5 *LIA approves or rejects loan* LIA's approval should be contingent on the household's ability to repay the loan and on whether the work to be performed fits within the concept of hurricane resistance retrofitting.

6. *Upon loan approval, contractor is selected.*[3]

7. *Supplier/Contractor receives 50% of the down payment to buy and deliver materials and begins work*

[3]The Project may also be implemented with the self-help method, provided the beneficiary has undergone some retrofit or related construction training (preferably through the Project's outreach or training components)

8. *Contractor completes work.*

9. *Estimator performs final inspection using the Minimum Standards Checklist.*

10 *Upon Estimator's recommendation, final payment is made to contractor.*

11. *Loan recipient makes first monthly repayment (30 days after initial loan disbursement).*

12. *Loan recipient makes final repayment at end of loan period.*

13. *Loan file is closed upon completion of loan repayments*

D. Role of Estimator

The lead implementing agency directly supervises the work of the Estimator during the initial phase of the Program. The Estimator is specifically responsible for making structural cost estimates, preparing a list of needed construction materials and giving practical instructions to the builder/contractor. All loans that are approved by the LIA must be "pre-costed" by the project Estimator using the Minimum Standards Checklist The Estimator is also responsible for final inspection of the retrofitting work and for authorizing final payment to the contractor

One of the priority objectives of the Program should be to incorporate all costs incurred during the construction/retrofitting process into the loan extended to participating households—including the cost of the Estimator. While the LIA may subsidize the work of the Estimator during the first phases of the project, it is recommended that, in the future, the cost of purchasing the services of an Estimator be factored in each individual loan amount.

IV. Hurricane Safety Construction Basics

The work involved in strengthening key components of houses to withstand hurricane-force winds (retrofitting) should conform to the minimum standards set by the country where the Program is implemented, including local building codes and Organization of Eastern Caribbean States (OECS) guidelines. As an overarching goal, houses must achieve resistance to hurricanes by incorporating robustness and consistency at key connection points.

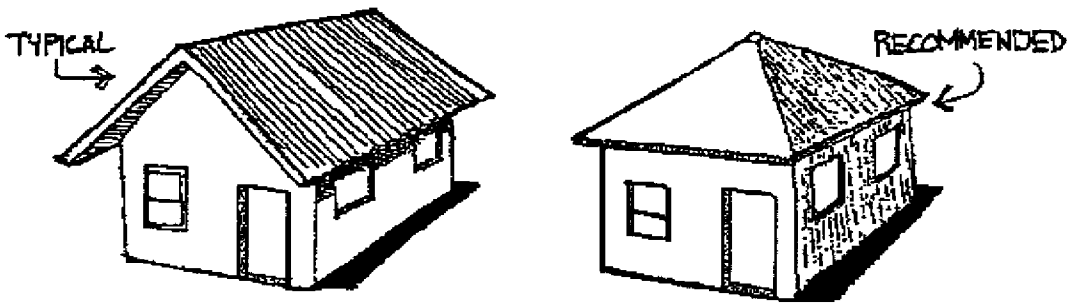
For each house to be retrofitted, an initial inspection must be performed by competent personnel (Estimator, Project Officer, Contractor) The inspection should focus on the "load path" (potential weakness of structure at key connections) and on the level of degradation of existing structural members "External" factors (site, trees) should also be taken into account. Appendix G provides a minimum standards check list for hurricane resistant housing in the Caribbean region

"Make the Right Connections," a booklet prepared by the Safe Shelter Initiative (SSI) of Dominica (Appendix I) provides a comprehensive overview of safe construction techniques promoted under the CDMP. The following is a summary of some of the most important points included in that booklet.

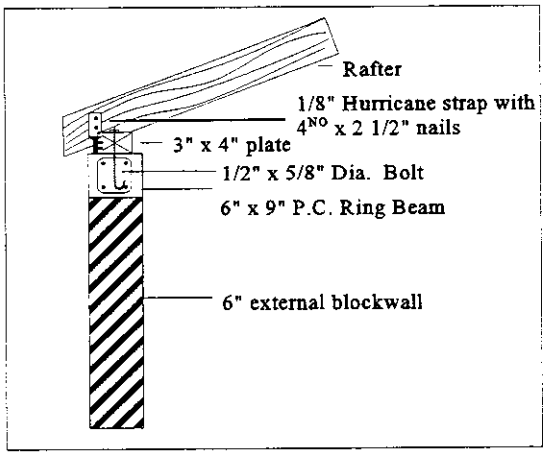
- *Site.* A house should be built on stable, flat and firm ground. Avoid construction sites prone to slide during the event of a hurricane Avoid loose sands or sensitive clays. Avoid sites subject to rock falls, proximity of big trees, etc.

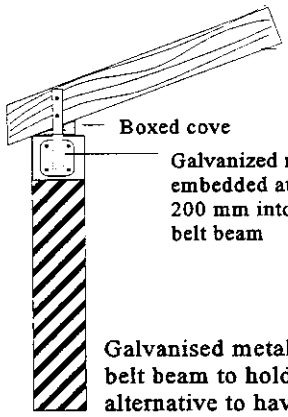
- *Shape.* Avoid asymmetric structures. Squared-shaped houses have a higher chance of withstanding high wind velocity than rectangular houses Avoid complex designs and houses with more than one story.

- *Roof form and angle.* The roof pitch should not be less than 20° (ideally 30° or more), and hip roofs are more hurricane resistant than gable roofs. If the house's roof has a pitch of less than 22 degrees, it may be improved by additional rafters and roof cladding.



- *Collar ties, gussets, or metal straps should be used to securely tie the ridge board to the rafters.* Rafters should also be securely tied to external walls with hurricane straps (see details below). Ridge connections can be improved by adding diagonal braces.





Galvanised metal strim embedded into concrete belt beam to hold down rafter. This is a good alternative to having a wallplate.

- *Roof sheets.* 24 gauge galvanized sheets (or lower) are recommended. If 24 gauge are not available or are too expensive, extra reinforcements must be used for light weight (26 gauge) sheets. The use of drive screws (at least two-inch deep into the purlin) are also recommended. If nails must be used, use galvanized coated nails (with wide heads) that are long enough to bend below the lath.

- *Overhangs.* Overhangs should be no more than 18" (horizontal distance from wall) if boxed and 8" if unboxed; patio and verandas roofs should be constructed separate from the main roof.

- *Walls.* The wall plate should be fastened and strapped to the top of the studs (uprights). Walls should be braced diagonally and fixed to the foundation by anchor bolts. Look for timber seepage and condensation, decoloration, fungus, insects etc. The presence of knots and other defects make timber a non-homogenous material and its quality has a considerable effect on its performance in the event of hurricanes or other natural hazards. Keep wood above ground level to prevent damage (humidity, decay, plagues etc.) Connections in a frame can be made more rigid by adding metal strips or clamps.

- *Foundations.* Concrete foundations should be reinforced, with wall reinforcement tied to the foundation. Avoid if possible the use of sea sand for construction (high content of salt), as it may reduce concrete's resistance and durability. Soil must be well compacted before pouring concrete to avoid cracking and soil settlement.

V. Loan Program

A. Overview

One of the most critical components of the USAID/OAS/CHF initiative is the retrofit revolving loan fund, established and seeded by CHF. This fund provides low-income families an opportunity to improve and protect their homes from hurricane forces by providing access to small loans, which must be repaid in monthly payments not exceeding 25% of monthly family income.

When establishing the loan ceiling and average, collaborating partners must take into account the financial profile of the families targeted by the Program. For each country where the Program is implemented, the necessary data for an accurate review of retrofitting costs may not become available until several houses have been completely retrofitted. After a review has been conducted, the initial loan ceiling may need to be adjusted in order to meet the actual construction and labor costs incurred All collaborating institutions must approve on any amendments to the agreements on the loan ceiling or the targeted average loan size. As a general rule, loans should average EC$3,000 and be no more than EC$6,000. Additional restrictions on the size of the loans may apply depending on the funding source In such cases, a combination of funding sources may be required to combine the beneficiaries' home improvement needs with the program's hurricane safety objectives

The lending model for the project is adapted from CHF's successful home improvement credit methodology. The basic tenets of this methodology are as follows:

Loans must go towards home improvement

- *Loans must target families earning the country's median household income or less.*
- *Loans must be small.* Although there are wide variations in the average loan amount for each CHF program, loans in the U.S. $500 to $2,500 range will be considered as falling within an acceptable range for CHF programs. Loans targeted to micro- entrepreneurs can vary from the $50 to $500 range.
- *Loans must be repaid within a short period of time.* To mitigate possible loss of monetary value due to downward currency fluctuation, a six-month to two year period is considered an acceptable range for CHF programs
- *Loans must be extended to beneficiaries at or near-market rates.*

- *Monthly loans repayment should not exceed 25% of beneficiaries' monthly income.*
- *Total household monthly debt burden (including housing loan) should not exceed 40% of monthly income.*
- *Local construction technology and materials should be used in the construction process.*
- *A certain amount of self help (sweat equity) should be incorporated into the construction process.*
- *Loans do not have to be collateralized, but there should be at least one credit-worthy co-signer.*

The revolving loan program has a dual function: (1) it is intended to help low income families improve the condition and livability of their homes; and (2) it was established to provide future institutional contributors with a track record of technical and financial viability A long term objective of the Program is to capitalize the loan fund at the level needed to cover the operating costs of the local implementing partners with the reflows and the interest earned on the loans.

The repayment rate on all of the revolving loan programs based on CHF's credit methodology has historically been at 90%, or higher, despite the fact that loan recipients usually belong to low-income earning families—a target group traditionally considered "high risk" by the formal banking sector. In the early stages, CHF's experience in the Caribbean fits the historical pattern In St. Lucia, 20 out of 22 project loans were being repaid on time after the first nine months of Program implementation—despite the economic hardship which followed the passage of Hurricane Luis and Marilyn over the Eastern Caribbean.

B. Loan Conditions

A fundamental component of the Hurricane Resistant Home Improvement Program is the use of near-market interest rates for the loans. The rate is low enough to attract a sufficient number of qualified borrowers within the target group of the loan program and high enough to compete in the local market. Further, near-market rate loans allow the borrower to build a credit history which may open the doors to future home improvement loans with local commercial banks and credit unions. Loans are made in US dollars to the Lead Implementing Agency, and on-lent to local beneficiaries in local currency.

While the loans do not have to be fully collateralized, all loan applicants must have at least one co-signor with adequate income or collateral to support repayment of the loan should the borrower not be able to meet her/his obligations. The loan applicant and the co-signor

must fully complete and sign the Loan Application Form. Other methods for improving loan recovery include. (1) accepting a bill of sale on goods or property owned by the beneficiary; (2) requiring a refundable cash deposit; and (3) requiring a repayment authorization to be drawn directly from the beneficiary's salary

C. Program Marketing

Marketing the loan component of the Hurricane Resistant Home Improvement Program is conducted by the local implementing partners with assistance and coordination from the USAID/OAS/CHF partnership. The local NGOs target those individuals who have the potential of fulfilling the program's loan requirements and whose homes need to be upgraded to be hurricane resistant. A suggested marketing plan includes the following

1. Prepare a brochure or flyer which highlights. benefits to families, target population, requirements, repayment methods, and suggested guarantees for the Program.

2. Distribute the brochure/flyer in target communities making use of churches, universities, and organizations or factories with eligible employees.

3. Advertise in local newspapers, religious bulletins, and on local news and radio stations.

4. Conduct briefings with various community-based organizations, unions and technical groups who have eligible members.

The Program should be promoted during all phases of the project to provide a gradual progress report to the general population. This method serves to successfully persuade residents on the importance of retrofitting their homes as well as to demonstrate that the Program is responsive to the needs of its targeted communities A clear emphasis should be placed on the entire island making its homes safe and resistant to all but the most violent hurricanes.

D. Loan Application Process

The loan application process begins once the social marketing initiatives have generated a substantial number of prospective loan recipients. The Lead Implementing Agency is responsible for the development and tracking of the loan approval procedure and criteria The following tasks should be accomplished to effectively complete the application process.

1. The LIA conducts an eligibility screening to verify that the potential applicant meets the basic requirements.

2. The LIA must account for all individuals who did not meet the basic criteria and thus did not complete an application A log book should be kept to track all applications received by the LIA.

3. Representatives from the LIA should explain all loan requirements to applicants who pass the eligibility screening—including legal recourse available to the LIA should the borrower fail to repay the loan according to schedule.

4 The LIA officer should help the applicant complete a Loan Application Form along with her/his co-signor.

5. Once all forms are complete, the Loan Application Form must be forwarded to the LIA's loan officer.

6 The loan officer logs the loan application into its tracking system and submits a copy to the institution responsible for the management and implementation of the project (role currently fulfilled by CHF).

7. The loan is reviewed by the Program's loan committee and recommended for approval

8. Once approval has been granted, the LIA notifies the beneficiaries in writing and sets up a repayment schedule based on the loan amount, term and interest rate

9. The loan's first tranche is disbursed directly to the contractor or supplier.

E. Construction Monitoring

The construction monitoring process provides the borrower with technical advice during the construction phase of the project and provides the LIA with insurance that the funds are being used in their intended manner. The Project Officer or the Estimator must thoroughly review and report on the progress of the construction work using the Minimum Standards Guidelines (see Appendix G).

The following tasks are performed by the LIA for construction monitoring:

1 Once the loan disbursement schedule is finalized, a Project Officer is assigned to the project.

2 A site visit schedule is then developed and is accompanied by a disbursement.

Disbursements never exceed 50% of the loan and generally are made directly to the contractor and/or suppliers. It is critical the LIA avoid providing large amounts of loan funds directly to the borrowers thereby risking the funds being used for family emergencies

etc, rather than home construction/retrofitting. Diverted loans funds have historically produced repayment difficulties and jeopardize the entire loan portfolio.

3 The Project Officer monitors the construction and approves further disbursements. This process continues until minimum standards checklist is completed and the entire loan amount is disbursed.

4. Once a project is completed, the Project Officer summarizes the home improvement as part of the reporting requirements.

F. Loan Collection Process

At the time the loan agreement is signed, a repayment schedule is provided to the borrower. Repayment typically begins 30 days after loan has been disbursed. Repayment locations should be as convenient to the borrowers as is reasonably possible. Arrangement with local commercial banks should be strongly considered.

The following outlines the steps the LIA should take for the collection of loan repayments.

1. Thirty days after the disbursement of the loan, the borrower makes her/his initial payment;

2. A receipt is provided to the borrower indicating the amount that was paid,

3 If a borrower is one week delinquent in repayment, the LIA sends a late repayment reminder,

4. After three weeks of non-payment, the LIA sends a second late payment notice informing the borrower of the consequences as outlined in the original agreement;

5 After six weeks of non-payment, the LIA will send a letter warning of enforcement action against the borrower and his/her guarantor;

6 Eight weeks after the scheduled repayment date, the LIA sends a letter from its legal department stating that legal action will be carried out on the 91st day of the delinquency. This notice will stipulate the steps to be taken to insure repayment.

VI. Outreach/Awareness/Marketing

In each country where a Home Improvement and Hurricane Resistance Program is implemented, the lead implementing agency should coordinate outreach and awareness campaigns both at the community and national/governmental level

A. Community Level

As a basic strategy, the LIA should take advantage of existing community structures to publicize the Program and its benefits Among other tasks, the LIA should:

- Involve key community leaders and institutions, including: village councils, youth groups, sports teams, parliamentary representatives, Community-based Organizations, churches, Community Crier;
- Work through development/lending programs already in place (church groups, credit unions, national development foundations etc),
- Involve other implementing partners in presentation to the community (e.g., finance institution, disaster officer, retrofit trainers),
- Hold meeting with a wide representation of the community and give adequate publicity to the meetings; and
- Identify a committee or person to facilitate the mobilization of community members, arrange for a venue and moderate meetings.

To ensure the proper dissemination of the program's message and to optimize the impact of community meetings, the LIA should seek to accomplish the following during these meetings:

- Carefully prepare and provide clear and relevant information on the program's benefits (safer housing), afford ability (modalities for loan repayment) using visual aids such as videos, slides, posters and brochures,
- Identify with community members the targeted geographic areas for the Program, as well as the program's potential beneficiaries,
- Record the names, addresses and telephone numbers of potential beneficiaries;
- Set-up specific dates and times for further discussions with identified beneficiaries;
- Identify basic needs to be further researched through social and credit surveys, home visits and retrofit estimates;

- Undertake, for illustration purposes, the inspection/evaluation of a house to be retrofitted, and discuss vulnerability points in the structural framework of the house as well as possible action to reduce that vulnerability

The experience of the CDMP suggests that the first series of meetings, while critical in introducing the Program to the community, should only be the first step in a coordinated effort. Within two weeks of the last community-wide meeting, representatives from the LIA should directly contact heads of households who have expressed an interest in the Program. Upon verifying that interest, the LIA should proceed to schedule an estimation of the work to be performed

B. National Level

From the inception of the Program, the LIA should seek to involve relevant national organizations in planning, implementing and evaluating the results of a safer construction campaign. From both a political and a programmatic standpoint, the Program will succeed only if it receives the support of the country's national disaster apparatus and of key personnel in the relevant government ministries or departments—including physical planners and housing officials.

The Program should also seek the active involvement and expertise of architects, engineers and contractors specializing in disaster-resistant housing.

At the onset of the Program, the LIA should approach the country's major financial institutions, including local and foreign banks, national insurance companies and pension fund administrators. These institutions are ideally suited to become the long term funding partners of the LIA once a track record for a cost efficient home improvement Program will have been established.

The LIA should plan for the systematic dissemination of the program's message through radio, television and newspapers. Following are some suggestions which may be implemented in planning successful national awareness campaigns:

- Ensure the selection of popular programming time for the radio and television presentations;
- Identify the Program in people's minds with an evocative slogan or jingle;
- Seek the collaboration of key media personalities to reduce advertising costs,
- Use government information programs and involve senior officials (including ministers) as much as possible,

- Prepare clear and concise press releases to coincide with Program milestone (launching, first workshops, first training sessions, first loan agreement, etc);
- Place billboards in strategic locations with LIA's telephone numbers clearly noted;
- Prepare and distribute flyers and posters explaining Program benefits,

The critical message to transmit in all the public awareness efforts is that never again should Caribbean peoples' homes be vulnerable to serious hurricane damage. **The existing construction techniques, technology and loan resources now make it possible for everyone's home to be made secure.**

VII. Monitoring and Evaluation

It is very important to establish a simple and consistent system to monitor progress and evaluate impact of the program. The on-going process of monitoring performance (tasks, schedule, costs/budget, other resources) and evaluating the relevance and acceptability of program activities within the community enhances the ability of managers.

- to document program performance and identify successes;
- to identify and assess obstacles and constraints,
- to capture exceptions to the program plan;
- to forecast and revise program outcomes;
- to re-allocate and redirect program resources;
- to make performance reports on a timely basis;
- to track long-term influence, sustained use and replication; and
- to design new activities based on prior experience and lessons preserved in evaluations so that mistakes or shortcomings have a positive impact on future activities.

A monitoring and evaluation (M & E) plan should be developed during the planning stage of the program so that resources can be allocated specifically to this effort and so that all stakeholders (implementing partners and community leaders) are on board before completing the program design phase. Begin by clearly stating what it is you want to achieve (objective), then list the activities that have been chosen to contribute to attainment of this objective. For example, if your objective is the adoption of building practices that will reduce natural hazard vulnerability, the activities selected for the program might be: providing training in disaster-resistant construction techniques; establishing a revolving loan fund so that residents can invest in appropriate safety measures, carrying out a promotional/public awareness campaign; and completing actual retrofits or new construction incorporating safer construction techniques.

Program partners (these might include a training group, a lending institution, a public awareness/promotion group, a community development organization, *et al*) are responsible for establishing realistic program targets and indicators of achievement related to these program activities

The final M & E plan should include the following:

1 A clear statement of the program *objective*

2. *Targets* stating the results or outcomes desired to achieve the objective. Targets may be either qualitative or quantitative and are directly related to the activities selected to achieve the objective.

3 *Indicators*: what will be measured to assess the intended changes and impacts of the program. Choose indicators that are easily measured and understood, and that are

based on reliable data sources. Although a program may have only 3 or 4 indicators to measure overall achievement of its objective, many other tasks and activities require performance monitoring, particularly those related to quality control and demand:

a. Community awareness
b. Demand
c Construction quality
d. Loan arrears rate
e. No. of persons trained who continue to use retrofitting techniques
f. Outside resources leveraged
g. Indirect impact (e.g., number of retrofits performed without program funds)
h. Effective rate of vulnerability reduction, when possible (e.g., how many program houses, as a percentage, withstood hurricane-force winds compared to non-program houses)
i Unanticipated results

4. *Baseline data* reflecting the situation or status prior to initiation of the program, should be collected to assess changes brought about by the program. Information should be gathered on the country's housing stock, construction practices, building standards, and housing regulations/laws. Interest expressed in the program should also be documented to determine whether it translates into actual demand and whether promotional efforts are effective.

5 *Benchmarks* represent important program outputs over time. Benchmarks may be stated as interim targets or as essential steps and are usually related directly to the project schedule and budget. They enable assessment of progress at interim points so that a program's status can be determined and changes made, if necessary. Typical benchmarks might include. number (or percentage in community) of houses strengthened; number (or percentage in community) of builders trained; numbers of training sessions conducted; listing of any major deliverables (training manual, videos, etc.).

Include in the plan a clear statement of who is responsible for collecting and reporting what information, and a schedule for periodic reviews and evaluations The mechanism for adjusting the program as a result of these reviews and evaluations should also be outlined in the M & E plan.

Periodically review the M & E system to ensure that it is providing reliable, timely information. If the system is not responsive to the needs of the implementing partners and other stakeholders, or if the information collected is not being used to improve decision-making, make changes, where necessary, to meet the objectives of the M & E plan.

If possible, arrange for local and national participants to continue providing periodic reports on continuation of efforts, spinoff activities, investment attracted, and other impact-related information that will create a true picture of the real value of this program over time. Particularly with regard to training or capacity-building activities, their effectiveness may not be easily discerned in the short-term, but these activities may produce a positive benefit stream for the target population over years far beyond the program period.

VIII. Training Builders

In each country where the Program is implemented, a cadre of builders, artisans, craftsmen and construction worker should be trained to assist in hurricane resistant construction/retrofitting techniques. In St. Lucia and in Dominica, training has been primarily provided by SSI and by SALCC. While the duration of courses has varied from two days to a week, each course should include both classroom-type sessions on the theory/techniques **plus practical sessions on actual hurricane resistant construction/retrofitting—preferably completing the retrofit of an existing house.** Such a course is also recommended or housing loan program officers and estimators.

A training video was developed by SALCC and is available to interested parties. LIAs should also seek opportunities to provide community residents with periodic training on a step-by-step approach to self-help retrofitting for hurricane resistance