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1.0 Caribbean Disaster Mitigation Project Summary

Over the past two decades the Caribbean region has experienced a dramatic upsurge in the level of destruction caused by hurricanes, tropical storms, flood events and volcanic eruptions. Events in the Commonwealth of Dominica, the Dominican Republic, St. Lucia, Jamaica and the eastern Caribbean countries served to focus attention on the de-stabilizing effects of these natural hazards on the Caribbean economies.

Based on this realization and the exploratory work started by the USAID Office of Foreign Disaster Assistance (USAID/OFDA) and the USAID Regional Housing and Urban Development Office of the Caribbean (RUDO/CAR), the Caribbean Disaster Mitigation Project (CDMP) was formulated. The Organization of American States (OAS) was selected as the lead agency responsible for its implementation with the then RUDO/CAR providing management oversight.

In September of 1993 the General Secretariat of the OAS and the US Agency for International Development (USAID) signed a \$5 million OFDA funded Cooperative Agreement to provide technical assistance for disaster mitigation in selected countries of the wider Caribbean.

A Technical Advisory Committee (TAC) comprising representatives from OFDA, USAID Missions in the project area and regional agencies involved in disaster management was formed to provide policy guidance, technical direction and periodic review of the project activities. In addition to this, a monitoring and evaluation consultant and OFDA field staff in Jamaica are continuously monitoring the CDMP.

The TAC has a membership comprising of representatives from the Caribbean Disaster Emergency Response Agency (CDERA), the Caribbean Community (CARICOM), Caribbean Development Bank (CDB), Mission Disaster Relief Officers (MDRO's) of USAID missions in the region, the Organization of American States (OAS), OFDA/LAC staff, and the past director of the Pan Caribbean Disaster Preparedness and Prevention Project (PCDPPP) - a United Nations Disaster Relief Organization (UNDRO) project, which was implemented in the Caribbean for a period of 10 years and ended in 1991.

At one of the more recent TAC meetings in Jamaica (April 1998) it was decided to award a one year no cost extension to the CDMP to allow the project implementation unit additional time to focus on the sustainability issues related to the project. The new Project Assistance Completion Date (PACD) is now September of 1999.

The purpose of the CDMP is to establish sustainable public/private sector mechanisms, which measurably lessen loss of life, reduce the potential for physical and economic damage and shorten the disaster recovery period in the project area. The project seeks to make development more sustainable by strengthening- the linkage between development and disaster mitigation. The CDMP therefore focuses on major issues relating to:

- Improving sustainable development by reducing natural hazard vulnerability in existing and planned developments;
- Improving public awareness and development decision making, by accurately mapping hazard prone and environmentally fragile areas; and by,
- The promotion of loss reduction incentives and hazard mitigation in the property insurance industry.

1.1 Planned Results

- Pilot activities conducted with collaborating public and private sector partners to promote acquisition and application of disaster mitigation skills, techniques and methodologies.
- Increased pool of public and private sector professionals in the Caribbean region with disaster mitigation skills.

1.2 Program Outcomes

- Reduced vulnerability of basic infrastructure and critical public facilities
- Improved building standards and practices
- Increased availability and access in the region to natural disaster/natural hazard vulnerability information for use by the public sector and private sector developers, investors and insurers.
- Increased community awareness of disaster preparedness and mitigation measures
- Unproved ability of public sector and private property insurers to link premium structure to risk.

Pilot projects have been established in Belize, the Dominican Republic, Haiti, the Eastern Caribbean and Jamaica and encompass the following areas.

1.3 Activity Streams

(i) Vulnerability and Risk Audits for Loss Reduction in Lifelines and Critical Facilities:

This activity promotes and supports efforts to reduce the vulnerability of basic infrastructure and critical public facilities. Since its inception, the CDMP has worked in close association with the Caribbean Electrical Utilities Services Corporation (CARILEC) on vulnerability reduction in electrical utilities through technical studies, modeling and drainage assessments after Hurricanes Luis and Marilyn. These efforts have served as a basis for a manual, "Mitigation of Damage Caused by Natural Hazards" published by the CDMP, which is currently being introduced to member utilities as a guide for conducting vulnerability assessments. In addition, the CDMP recently completed an activity which focussed on developing cost-effective retrofit options and guidelines for existing shelters and to develop guidelines and processes to ensure that schools and other buildings which serve as shelters are safe for that use. Engineering designs for building retrofit works and guidelines for hazard resistant new construction were developed to support the long-term sustainability of this work activity. The Caribbean Development Bank (CDB) has committed funds to this exercise and extended a line of credit to countries wishing to retrofit existing structures and erect purpose built ones. The recently held regional workshop in St. Kitts & Nevis coincidentally in the wake of hurricane Georges, served to reinforce the need for this kind of approach in the region. Over 90% of all the school buildings on the island of St. Kitts suffered damage from Hurricane Georges. Some of them were totally destroyed. In many areas of the Caribbean, the Hotel and Tourism Industry is central to economic livelihood. Caribbean tourism infrastructure is typically built in the coastal zone, which is prone to inundation. Increasing resilience of the tourism building stock to natural hazards will better position the region to recover from the social and economic shocks, which accompany hazard events. The CDMP has been working with the Caribbean Hotel Association (CHA) to update its "Hurricane Procedures Manual" and has included a chapter on "Structural

Vulnerability and Loss Reduction Techniques ". In coordination with CHA, the CDMP is sponsoring a series of workshops for the hotel industry on hurricane preparedness.

(ii) Promotion of Natural Hazard -Resistant Building Standards and Practices:

This activity assists countries to establish appropriate safer building standards and practices in both the formal and informal building sectors. The CDMP has worked with the UN Center for Human Settlements (UNCHS) to help Antigua & Barbuda, the Commonwealth of Dominica, St. Lucia and Grenada to introduce a building code based on the model code developed by UNCHS for the members of the Organization of Eastern Caribbean States (OECS). Based on this initiative, the Caribbean Development Bank (CDB) in the wake of Hurricanes Luis and Marilyn in 1995 began requesting on a pilot basis, that countries refer to the Caribbean Uniform Building Code (CUBIC) for developing design standards for large development projects.



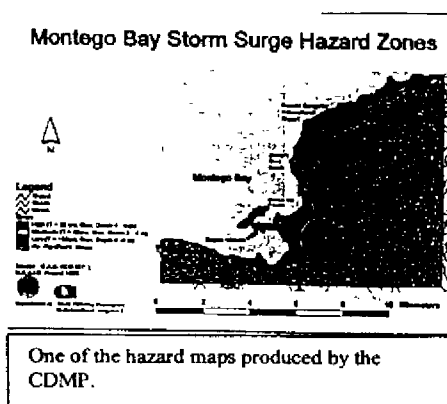
Materials for retrofitting are stored against this Carib Reservation house in Dominica.

A housing retrofit campaign in St. Lucia and Dominica is directed at making low-income housing more hurricane resistant and promoting the use of improved building practices by homeowners and builders. The campaigns, which are led by local NGOS, include the training of artisans, outreach to vulnerable communities and a retrofit loan fund to provide individuals with financing for retrofitting. Houses retrofitted

under this program in the Commonwealth of Dominica, withstood the ravishes of Hurricane Luis in 1995. The Antigua National Development Foundation (NDF) is implementing a similar activity patterned after the St. Lucia and Dominica activity. This is funded in part by the local organization and receives technical

assistance and some funding from the CDMP. The project conducted a highly effective Lessons Learned Workshop in October of 1996 which shared the lessons learned from implementing these activities, solved problems and made recommendations for future improvements. It was also used as a vehicle to encourage the replication of this type of activity among non-beneficiary countries. Coming out of discussions at this workshop was the decision to target low income persons seeking funding for home improvement and to use this as a conditionality vehicle for promoting the low income housing retrofit concept in the pilot areas. This is an activity that has been quite challenging for the project since its inception. It has suffered from low demand due to the inability of the most needy of this group to qualify for credit from the implementing agencies.

(iii) Generation and Use of Natural Hazard Assessments and Risk Mapping:



One of the hazard maps produced by the CDMP.

This activity helps countries to develop the capability to map hazard prone areas and encourage national planning and international lending Agencies to incorporate disaster mitigation into development projects. CDMP developed a numerical computer-based model for estimating storm-surge, wave action and flooding potential for coastal areas in the Caribbean region. The model has been installed at the Caribbean Meteorological Institute (CMI) in Barbados. Pilot applications are underway and have been completed in Jamaica, Belize, Antigua/Barbuda and the Commonwealth of Dominica. A multi-hazard mapping project, which includes flooding, landslides and seismic risk of the Kingston Metropolitan Area

(KMA) in Jamaica, is close to completion in Kingston Jamaica. The Jamaican Government

in 1996 made provisions for the use of this information in the National Land Policy of Jamaica. Under these provisions, government technical agencies will continue the mapping activities started by the project and the government planning agencies will use these maps as input for the development approval process. At the invitation of the CDB, the CDMP organized training seminars for bank staff on "Incorporating Natural Hazard Considerations into the Project Preparation Process". The bank has since made a policy decision to include the recommendations in its project appraisal and lending practices.

(iv) Promotion of Loss Reduction Incentives and Hazard Mitigation in the Property Insurance:

This activity identifies ways in which the industry can encourage sounder development and construction practices. CDMP worked with the Insurance Association of the Caribbean and national Insurance Associations in Jamaica, Belize and the Dominican Republic to promote a more active role within the industry for reducing, catastrophic risk. Training workshops have been held to increase awareness of hazards and appropriate mitigation strategies through better use of hazard information and the promotion of incentives for hazard mitigation among property owners. The CDMP has also been working with the CARICOM Working Party on Insurance and Reinsurance. The project prepared for this working group an issues paper on catastrophe protection in the Caribbean and assisted the working party in the preparation of its report for the CARICOM Heads of State. The movement of this at the CARICOM level has been quite slow but the initial document produced is constantly being used as a reference for the advocates within CARICOM and industry personnel in the region. With the slow progress received at the regional policy level, the CDMP decided to change its focus a bit and to concentrate on promoting the use of its wealth of information on hazards and loss reduction among smaller insurance companies in the region, with the resident authority to make decisions on premium pricing. The United Insurance Company of Barbados, with branches in St. Lucia and the Commonwealth of Dominica, accepted this challenge and has since embarked on a promotions campaign among its clientele which offers up to a 25% reduction in premiums, to participants of this program.

(v) Mitigation Policy and Planning:

In 1996 the CDMP embarked on an activity to assist Caribbean countries to address the issue of mitigation planning at the regional and national levels. This initiative was necessary to put into perspective and package the use of many of the mitigation interventions made by the project. Many of the countries in the region had not embarked on any mitigation planning and were now being exposed to mitigation tools which can be most usefully applied within the context of a policy and plan at the national level. There was also the need to improve coordination and cooperation between emergency coordinators and development planners. This activity was initiated in collaboration with the Caribbean Disaster Emergency Response Agency (CDERA) and developed with the planners and disaster managers of the region. The outcome was a process-oriented mitigation planning guidelines document, which was developed to assist countries initiate mitigation planning at the national levels. The CDMP supported the development of two national mitigation planning activities, one in Jamaica and the other in St. Lucia. Both countries have used the guidelines for developing mitigation policies and plans. The regional group of planners and disaster managers met in March of 1999 to review the hazard maps that have been produced by the project so far and to develop a working methodology for the use of this information in the vulnerability assessment phase. Of significance in this workshop were discussions on modalities for the appropriate use and application of this type of information in the development planning process. This is quite a challenge in the region since many of the countries do not have the precedent or policies framework required for the easy application and use of the mitigation tools produced by the project.

Support for a comprehensive approach to hazard mitigation planning was given by ministerial representatives at the UNCHS/Habitat Regional Ministerial Meeting in 1996 in the "Plan of Action for the CARICOM Ministers of Human Settlements" and in the "Partnership for Prosperity and Security in the Caribbean" which was signed at the Caribbean/ United States Summit in May 1997.

(vi) Facilitating Community Based Disaster Preparedness and Prevention:

These activities assist communities in identifying their hazard vulnerability and in organizing and maintaining their preparedness for hazardous events. In the Dominican Republic, the CDMP was instrumental in the establishment of the Dominican Committee for Disaster Mitigation, an NGO with an extensive support network consisting of other NGOs and private companies. The NGO is implementing an action program, which includes public education,



Construction of 400 metre dyke to keep off flood waters.

and training which collaborates closely with the USAID/OFDA Disaster Management Training Program being implemented in the Dominican Republic. Attention is also placed on the coordination of NGO and private sector preparedness and response efforts and support is given for selected community mitigation initiatives.

A similar program was started in Haiti. Its initial focus was on introducing disaster mitigation in the National Environment Action Plan under preparation by the Ministry of the Environment, and on strengthening preparedness and response capacity in the most vulnerable areas, including collaboration with a major

Red Cross Training Program. The initially proposed coordination with the National Environment Action Plan in Haiti had to be abandoned due to overwhelming political difficulties experienced in Haiti at the time. The program in Haiti now focuses solely on building a capacity within three vulnerable communities for preparedness and mitigation. This activity collaborates closely with the OFDA/LAC training program and use is being made of the methodology, training materials and technical advice from this program.

(vii) Incorporation of Hazard Mitigation into Post-Disaster Recovery Post Disaster Mitigation:

This activity assists eastern Caribbean countries with incorporating mitigation measures into reconstruction efforts. Following tropical storm Debby which affected St. Lucia in 1994, the CDMP conducted a landslide damage assessment and prepared debris flow hazard maps to guide a World Bank funded reconstruction program with recommendations on infrastructure design, land-use controls and improved farm practices to increase hillside stability. After Hurricanes Luis and Marilyn in 1995, CDMP, in collaboration with CDERA and UNESCO, organized training workshops for local builders in safe construction and roof retrofit in Antigua/Barbuda and St. Kitts/Nevis. The CDB invited the CDMP to undertake a storm hazard assessment for the Commonwealth of Dominica, as part of a loan for the rehabilitation of the coastal infrastructure damaged by Hurricane Luis. The activity involved a storm surge and wave analysis and the formulation of hazard resistant design criteria for the reconstruction of this sea defense. More recently, the CDMP was involved in defining post disaster mitigation interventions after the Layou River Dam disaster in the Commonwealth of Dominica. The project, in the wake of Hurricane Georges in 1998 is making itself available to provide mitigation technical assistance to the donors involved in the reconstruction effort.

(viii) Technical Training and Information Dissemination:

The success of the CDMP requires that disaster mitigation information and technical skills be accurately and effectively transmitted to project participants. Accordingly, each of the CDMP activities described above include, as appropriate, workshops, technology transfer, training sessions, the drafting and distribution of training manuals and other publications and/or the establishment of public information campaigns, as essential components in their implementation

(ix) The CDMP and the Development Finance Institutions:

In an effort to increase awareness of natural hazards and promote the use of this type of information in development, the CDMP initiated an activity with the Caribbean Development Bank (CDB) shortly after the project's inception in 1993 for the purpose of influencing the lending policy of the bank and encouraged the CDB to include more considerations for natural hazard assessments when developing criteria for loan qualifications. The CDMP has conducted two workshops for the project development staff of the Bank. After the first workshop, a policy decision was made at the CDB to amend its existing environmental impact assessment procedures to include considerations for natural hazard reviews. A major impact of this intervention occurred when the CDB demonstrated a commitment to this process, by placing natural hazard mitigation conditionality on the loan package for the reconstruction of the damaged sea wall, in the Commonwealth of Dominica. (Referred to in sec. vii). Hurricanes Luis and Marilyn destroyed this sea defense structure during the 1995 hurricane season. The CDB further defined this conditionality by insisting that coastal engineers use storm surge maps produced by the CDMP when developing the design parameters for the reconstruction. Since this intervention, the CDB has developed, approved and adopted a Disaster Management Policy for the Bank. This policy embraces the mitigation concept and allows for the provision of disaster response Grant funds for the region. The CDMP was asked to review and comment on this policy. The CDMP has also been working with the World Bank on determining the probable maximum loss for public infrastructure and is collaborating closely with the bank on the design of its multimillion dollar disaster management project for the OECS Countries in the Caribbean.

The Caribbean Disaster Mitigation Project is effecting the kinds of impacts the project was designed to create and is getting the support and attention from the participating governments and regional institutions. Because of the nature of the activities some of these impacts were slow in coming. However there has been progress in the response of the private and public sector to the partnership initiative, especially in the Dominican Republic. There is also some evidence of some of the policy changes and commitment of resources this project needs for success emerging from some of our collaborating institutions. This however represents only the tip of the iceberg. There is a lot of work still to be done in the Caribbean for achieving the desired integration of disasters and development issues on a sustainable basis and for a meaningful reduction in loss of life, property and recovery time from future natural hazard impacts.