The funds authorized for these operations will constitute nonreimbursable technical cooperation, and to ensure an adequate volume of readily available funds, the Bank will grant priority access to the Fund for Special Operations (FSO) for these operations.

# HEALTH EMERGENCY PREPAREDNESS IN THE CARIBBEAN

May 1980

1. Objective of the Project

To contribute to the process of development and self-support of disaster-prone countries in the Caribbean through pre-disaster planning and training in the health sector.

2. Place of Implementation

The project will be implemented by PAHO in cooperation with CARICOM and other agencies in countries selected for the program on the basis of their vulnerability to natural disasters:

. All Caribbean countries and territories: Angullla, Antigua, Bahamas, Barbados, Belize, Bermuda, British Virgin Islands, Caymans, Cuba, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, Montserrat, Nevis, St. Kitts, St. Lucia, St. Vincent, Trinidad and Tobago, Turks and Caicos.

3. Background Information

The Caribbean countries are closely interdependent in terms of health programs and disaster-related activities. On the one hand, factors such as:

- the small size of most countries with the corresponding scarcity of human and economic resources;

- the geographic isolation and/or dispersion of part of the national population in a large number of disaster-prone islands;

- the diversity of cultures, languages, economic and social systems;

- the widely different levels of development,

contribute to the increasing demand for technical cooperation and support before and during emergencies. On the other hand, there is a recognition by the Caribbean countries, individually or through the Caribbean Community (CARICOM) representing the English-speaking countries or territories, that programs and materials developed for use in developed countries or Latin America require extensive readjustments, if not a throughly original approach, based on the specific features of the Caribbean.

3.1 Health Situation

There is a considerable diversity of health systems and policies in the Caribbean. For instance, in the West Indies health policy, although still largely unwritten by indivdual territories, is directed toward the achievement of several clear cut objectives: provision of health services to the entire population free of charge or at the lowest possible cost; extension of coverage and improvement of the quality of care; reduction of gastroenteritis and malnutrition; improvement of maternal and child health services; maintenance of effective immunization programs; improvement of environmental health conditions with special reference to provision

of safe drinking water and sanitary disposal of human and solid wastes; development of adequate numbers of trained manpower, and promotion of health education in order to achieve community participation in the provision and development of health services.

It should be noted that the mean mortality rate of the 1-4 age group is around 3 per 1,000 inhabitants and that in this age group some deaths are due to diseases which are preventable by immunization. With regard to water supply, although between 70-95% of the population is recorded as having access to water supplies, these indices mask the fact that the area suffers from chronic shortages of water. The situation is much more unsatisfactory with wastewater systems and sewage disposal.

3.2 Vulnerability to Disasters

Depending on the location of the countries, natural hazards, like earthquakes (e.g. Trinidad and Tobago), volcanic eruptions (St. Vincent, 1979), hurricanes (all islands, as illustrated by serious disasters in Barbados, 1955, in Haiti, 1964 and hurricanes David and Frederick in Dominica and the Dominican Republic, 1979), floods (in the Dominican Republic and Jamaica, 1979) and drought with its sequel of malnutrition (in Haiti, 1974 and 1977). The authorities expressed their need for cooperation in the field of technological disasters, such as air crashes, explosions, major fires, etc.

The impact of natural disasters is worsened by the particular weakness of the health services and the government's structures. A total disruption of the smallest islands is common in case of natural disasters. For instance, the temporary evacuation and care of 10,000 persons constituted a major problem in St. Vincent (population less than 100,000 inhabitants). Although of modest dimension on the global scale, this emergency may overwhelm the government's capability and require extensive managerial and economic support from the Caribbean and international communities.

3.3 Emergency Preparedness

3.3.1 The disasters in 1979 (floods in Jamaica, volcanic eruption in St. Vincent and the hurricanes in the Dominican Republic and Dominica) underline the lack of preparedness in the health sector and the urgent need for adequate training of the essential personnel in most of the countries.

3.3.2 The level of preparedness in the Caribbean varies from country to country. For instance, in Barbados, Cuba and Jamaica an effective plan and coordination mechanism has been established which is periodically updated. This may provide a guide and model for pre-disaster planning to other countries. In Haiti and most of the small islands the preparedness level is critically low and will require extensive technical cooperation.

## 4. Proposed Activities

### 4.1 Emergency Preparedness of the Health Sector

4.1.1 Strengthening or establishing a sectorial disaster plan and a technical program on emergency preparedness within the health sector of the countries. In the Caribbean, the ministries of health will be encouraged to assign this responsibility to a senior health official as the limited resources will not justify a full-time post at country level.

4.1.2 A review of the existing disaster emergency legislation relevant to the health sector.

4.1.3 Adaption of the regional or general manual and training material presently available and in development under the PAHO regional program to the distinctive features of each national situation.

4.1.4 Formulation of technical guidelines for disaster relief in the health field (completion of the standard list of drugs and equipment, standardization of the medical treatment of mass casualties, etc.) and a local inventory of foreign agencies likely to provide health assistance in major disasters.

4.1.5 Support of short training sessions for health officials (e.g.: hospital administrators and medical officers in rural health centers) at national or regional level.

4.1.6 The development of simple educational material for the benefit of the general population in order to promote community participation.

4.1.7 Support and promotion of participation of the scientific community through applied research, technical evaluation of the material developed, and the inclusion of disaster management in curricula of medical schools, in particular, the University of the West Indies.

4.1.8 Establishment of limited stockpiling of emergency equipment (i.e. laboratory supplies, sanitary engineering equipment, drugs, field communication sets, etc.) at regional level. Maintenance could be monitored by PAHO, CARICOM or other suitable agency or government.

4.1.9 Improvement of existing emergency facilities (emergency medical services, generators, laboratory emergency support, etc.).

4.2 Assessment of Needs in Case of Disaster

4.2.1 The lack of accurate information on the extent of damages and the priority needs in the health sector is the most critical factor affecting the decision making process, both in the affected country and in the international community wishing to assist in the emergency phase.

The assessment of needs and the determination of priorities is the prime responsibility of the affected country. It is however a technically difficult task for which most Caribbean countries are presently not prepared.

4.2.2 The following activities will be carried out in cooperation with the following countries:

- identification of health professionals with broad experience in disaster relief management to be included in the roster of emergency experts of the Organization, of Member Countries, and of other recognized organizations (activity in progress);

- training of selected nationals to constitute a source of stand-by expertise and a local team to undertake the assessment of the needs in the health sector following the impact of a disaster;

- direct support of the assessment activities carried out at national level through PAHO staff member's technical cooperation;

- temporary assignment of experts from neighboring disaster-prone countries (roster of emergency experts) and material assistance (logistics, communication, transportation);

- scholarships/fellowships to nationals from member countries to participate in courses/seminars on disaster assessmemt and management organized outside the Region (e.g. WHO-sponsored course to be organized in Europe in November 1980).

5. TENTATIVE BUDGET (5 years)

| | TOTAL |
|---|---|
| Project Manager, including travel (technical cooperation, general coordination of the activities) | US$250,000 |
| Technical Officer/Consultants | 60,000 |
| Seminars/courses/training | |
| . one annual course at Caribbean level (5 days, 40 participants) | 220,000 |
| . one national course every second year (5 days, 20 participants) | 140,000 |
| Documentation, manuals, visual aids, public education | 90,000 |
| Feasibility studies (stockpile) | 10,000 |
| Support of simulation exercise | 35,000 |
| Limited equipment stockpiling (critical items only) | 100,000 |
| Analysis of vulnerability of essential services | 15,000 |
| Contribution/support of corrective measures | 150,000 |
| | US$1,070,000 |
| Miscellaneous: unforseen requests, inflation (15%) | 160,500 |
| | US$1,230,500 |

6. Supervion and Evaluation

- Emergency preparedness being essentially a component of each and every health program, the proposed project will be integrated into other activities carried out at country level with PAHO technical cooperation (especially development of health services, environmental health, and disease control).

- Direct supervision will be exercised by the PAHO Area and Country Program Coordinators/Representatives.

- Technical supervision and support will be provided by the PAHO Regional Advisor on Emergency Preparedness, in addition to that provided by the Program Manager recruited for this program.

- Evaluations will be carried out by the Regional Advisor and short-term consultants during field visits. In addition, the strict standards of the internal programming and evaluation system (AMPES) developed by PAHO, will be applied to the program. In each project, the detailed activities completed and in progress will be compared periodically with their parts of the program. The extent and causes of discrepancies between anticipated and actual achievements are coded and analyzed by computer.

- The establishment of a special advisory committee with participation of national experts is planned.

## HEALTH EMERGENCY PREPAREDNESS IN THE CARIBBEAN
### Programmatic Areas of Cooperation

I. PLANNING

. Preparation of a model disaster plan for the health sector.

. Preparation of a model plan for hospitals, including simulation exercises.

. Vulnerability analysis of:

  . health system/facilities
  . water systems

II. TRAINING

a) Training of small select group of experts (health sector):

  . high level managers/coordinators
  . hospital administrators
  . utility managers and sanitary engineers
  . logistic/supply managers

Need for:

  . technical support
  . political support
  . funding

b) Training of middle level health professionals.

Regional workshops by discipline:

  . special workshops (e.g. nurses, engineers)
  . inclusion of disaster preparedness as a topic within all meetings organized on other subjects.

National multidisciplinary workshops/courses (each country or group of countries with identical problems):

Need for:

. technical adaptation of existing material
. funding of meetings and of technical cooperation

c) Training of the general public by inclusion of the topic "Emergency Preparedness" in the health education programs:

. standardized leaflets
. broadcasting time
. video-tape

Need for:

. technical support
. funding of technical cooperation
. funding of broadcasting time/video-tape

III. STRENGTHENING OF OPERATIONAL CAPACITY

. Regional stockpile of supplies (following cost/benefit and feasibility studies);

. Increased inventory of drugs and emergency materials;

. Emergency rooms and laboratory support (through CAREC and CARICOM);

. Communication facilities (institutions and/or field teams).

# PUBLIC AWARENESS IN DISASTER PREPAREDNESS

## INTRODUCTION

1. Last year a Caribbean Seminar on Disaster Preparedness held in St. Lucia recognized that public information and education were essential components of a National Disaster Plan. The Seminar recommended therefore as a matter of priority that:

(a) a program of public education be undertaken. This program should highlight human safety and the reduction of human and economic loss and draw attention to details a of National Disaster Preparedness Plan;

(b) a list of simple disaster terminology be compiled, published and widely disseminated.

2. The contributions to this seminar and the survey which was conducted by the USAID Caribbean Disaster Preparedness Assessment Team in the region indicate that there is a general absence of disaster consciousness in the region. As a result, there was little or no knowledge of the kinds of disasters which are likely to affect a particular country and the kind of damage which is likely to follow any of these disasters. Also, little was known of the predictions, warnings and procedures which indicate that disaster was imminent.

3. It was discovered too that there were only a few educational programs geared to creating the kind of public preparedness which could save a life through paramedical care, the provision of food and water or temporary shelters for those cut off by the disaster.

4. This paper argues that the public information and education component of a national preparedness plan should be geared to:

(a) raising the consciousness level of the population to the kind of disasters, and the nature of the damage that are likely to occur; and

(b) education of the public in the techniques of preparedness.

## MASS MEDIA

5. In any crisis people are calmed and reassured by the voices, faces and names of people they know and feel comfortable with. Mass Media personnel create strong bonds with the public and therefore are important avenues for dissemination of information in times of national disasters.

6. It is known that the Mass Media's role in disaster preparedness is vital and should therefore be clearly defined in a National Disaster Plan. Newspapers, radio, television stations can assist with demystifying disaster threats by teaching appropriate responses to specific situations and also by disseminating information on preventive measures and preparedness plans. Keeping people accurately informed of what is happening just before, during and immediately after the disaster is another major function.

7. The media, however, has a responsibility to publish only accurate information, thus reducing the panic which can result from sensational reporting. Governments can contribute to this by taking the media into their confidence and keeping them properly briefed on matters of public interest but which may not be considered suitable for immediate release.

Government's Information Role

8. It has been pointed out by people who have worked in disaster situations that it should not be assumed that educating the public and providing information are of themselves sufficient to ensure that individuals will respond to warning on the basis of knowledge. Human response to disaster threats reveals very diverse patterns. Warnings must therefore be supplemented as necessary by clear instructions informing the public what it should do. Also, provided that the public is educated and well informed about the dangers resulting from hurricanes, earthquakes and floods, etc., there can be reasonable confidence that warnings and the accompanying instructions will receive a proper response. The objective is to create a partnership with Governments and people so that disaster preparedness is recognized as a joint responsibility.

9. Governments through their information service and Emergency Secretariat can contribute throughout the year to the general education of the public. These programs can be executed by a number of activities through press relations programming such as radio, television, daily newspapers and film. For example:

Local and Regional Broadcasting - documentary and news films, video and photographic records.

Audio Visual Services - Photographs, transparencies, T.V. stills and promos, photo packages, audio tapes and cassettes.

Exhibitions, Displays and Demonstrations - including information racks, closed circuit television programs.

Effective Image - by using Logos, letter heads and car stickers.

Publications - leaflets, manuals, handbooks, reference guides, brochures, etc. It is also important to have facts on past disasters in the region as well as lists of First Aid supplies, Survival Hints, Newsletters, National Disaster Preparedness Plans and others.

Visual Aids - Posters, bulletin board notices.

Various International Communications Programs for -

(a) Administration
(b) Employees in disaster related jobs, as well as employees in general, may be made available by newsletters or magazines.

Other Channels for information to the public can include speeches, "Call-in" programs on radio, seminars, conferences, community discussions and workshops. It is also necessary to have special events such as Disaster Simulations, National Disaster Preparedness Information Day/Week/Month and special newspaper editions during the Hurricane Season.

10. Disaster Preparedness education is, however, a specialized area and Government Emergency Secretariats should devise training programs in conjunction with international organizations for both Government information personnel and members of the private news media.

11. Training in broadcasting for journalists, public administration, disaster management and disaster research are a few areas which come to mind.

Community Involvement

12. Special campaigns should be designed and directed at school children. Disaster information can naturally be incorporated in such appropriate subject areas as Science, Geography, Social Studies, Current Affairs, Home Economics, Youth Development Training Courses.

13. Community groups, clubs, and Religious Organizations have a role in the Disaster Preparedness Information program and must be involved.

14. Training in first-aid, use of the CBers and Radio Hams, understanding of disaster signals, warnings, anc general techniques in coping with shock, inertia, and so on, should be included as part of the activity of all voluntary and social organizations in the country. Community leaders, both in the public and private sectors, can play a vital role in getting this program on the way.

15. Ultimately, linkages made by human beings, the contact, the sharing of experiences, the extended family networks, the relationship with local leaders and local bonds with voluntary organizations will be the most effective agents of education and this vehicle is one which is most often overlooked by policy makers and planners.

Communications

16. Looking ahead in our telecommunications areas, Satellite development will feature as a disaster related communications item in the eighties. The Caribbean islands, fragmented as they are, will the in future be using the Satellite to communicate with each other in the case of disasters which may wipe out normal communications networks. Satellites, however, may be most useful in the Caribbean for training. Seminars and workshops conducted in one island can involve people in other islands.

17. It is evident that the Transistor Radio has a vital role in the awareness program since these are portable and can be transported easily.

Conclusion

18. Finally, this brief outline indicates some of the areas of study as well as possible assistance which the Caribbean needs.

Training of personnel, equipment for use by communicators, a library of Audio Visual Aids programs which can be shared by the region, studies of the strengths and weaknesses - Communication network of each island, and proposals for strengthening weak areas are some of the things which this conference may wish to investigate.

Grace P.D. Pilgrim,
Secretary, C.E.R.O.

LEAGUE OF RED CROSS SOCIETIES

GENEVA

# FIRST AID TRAINING

(Basic requirements for First Aid in natural disaster)

May 1980

# FIRST AID TRAINING

The major aim of First Aid Training Programmes is to impart to the layman knowledge and skills which will enable him to assist a person in physical distress, generally due to an accident or sudden illness, until more qualified aid can be provided. It also aims at informing people on how to summon such aid.

## First Aid in Disaster Preparedness

We recognize the need for First Aid Training in Disaster Preparedness Programmes for, basically, two target groups, namely:

1. People living in disaster prone areas
2. Personnel providing, or assisting in the provision of, qualified medical aid

### 1. People living in disaster prone areas

It is commonly known that in any kind of natural disaster the most crucial period for the casualty is from the moment he or she becomes injured until the time qualified aid can be made available to him or her.

Anticipating that the functioning of the usual medical facilities will most likely be severely disturbed by the effects of the disaster, the casualty's well being will depend on the quality of aid which can be provided by the people in the immediate environment.

As the efficiency of First Aid is directly related to the number of people trained, the quality of their training and their readiness to apply their skills when needed, we are faced with the fact that a great number of people need to be given a high-quality training.

Public authorities and non-governmental organizations such as National Red Cross Societies, should make all possible efforts so that as many people as possible can be trained in First Aid.

To promote this idea and to facilitate the dissemination of such training the programme should be:

effective - limiting its content mainly to life-saving measures and techniques,

easy - concentrating on demonstrations and practical exercises rather than on theoretical lectures,

short - not more than 10 hours long to avoid or reduce "dropping-out".

As most of the First Aid courses presently taught are too comprehensive to meet those requirements, it may become necessary to develop a new concept for the teaching of

Basic First Aid

The elements of the curriculum should be:

1) Unconsciousness

Every unconscious person, provided his respiration functions spontaneously, is to be placed in a safety position which will provide the anatomical conditions to keep the air-passage free. Every unconscious person suffering from a respiratory arrest must receive artificial respiration.

2) Artifical respiration

Methods of expired air insufflation are considered the most effective means of artificial respiration and are to be taught. Artificial respiration is to be applied as soon as possible and has to be continued until spontaneous respiration recommences or qualified aid can be provided.

The establishment of a free air-passage by applying a hyperextension of the casualty's head is considered the first action to be taken in the application of artificial respiration.

In Basic First Aid courses the teaching of any alternative method is not recommended.

3) External bleeding

The application of hemostatic procedures is one of the measures to be applied immediately and in a gradual and progressive manner:

i. Direct pressure and a pressure bandage are to be applied on the point of bleeding. If the injury is located on the limb, additional raising of that limb is required.

ii. In cases in which the above measures are insufficient or cannot be applied, pressure may be directed to the corresponding arterial trunk.

iii. Finally, and only if the circumstances require, or if the previous procedures have failed, a method of circular compression (garrot, tourniquets) may be employed, taking into consideration the possible risks.

4) Shock

It is recognized that all injuries or sudden illnesses may cause shock to a life-threatening extent. Therefore, the immediate application of shock prevention measures is emphasized in all subjects taught.

The above mentioned subjects are considered core-subjects and are a "must" in all Red Cross First Aid programmes. They may be supplemented according to locally defined needs, bearing in mind that the time-limit suggested for this kind of training should not be exceeded.

## 2. Personnel to provide - or assist in providing - qualified aid

Assuming that all national disaster preparedness plans foresee the immediate dispatch of organized mobile medical units into the disaster stricken area, it is essential to place the greatest possible emphasis on training the members of these units.

Although it is not the purpose of this paper to make any suggestions about the compostion of such medical teams, it can safely be anticipated that a great number of their members will be volunteers, trained to assist and supplement professional medical personnel.

The major reason for using non-professional personnel in such teams may be:

i. lack of sufficient numbers of professional staff available for this purpose in disaster situations;

ii. relieving medical and para-medical staff to concentrate on tasks requiring more advance intervention;

iii. economical considerations;

iv. volunteers can/should be used as staff of temporary or permanent First Aid posts, ambulance services, etc. in non-disaster times.

The National Red Cross Societies and other voluntary agencies should be given the task and means to recruit and train such volunteers in sufficient numbers, well ahead of the time they will be needed.

Based on an assessment of training programmes which a number of Red Cross Societies have developed for this purpose, the following suggestions are made:

In addition to their training in Basic and Advanced First Aid (for curriculum see annex) all volunteers wanting to serve in a medical disaster unit should successfully complete a Proficiency First Aid course. The objectives of this course are to raise the performance to an extent that enables the trainee to purposefully assist medical personnel in disaster situations, and to assume full responsibility for the tasks assigned to him.

Proposals for the content of Proficiency First Aid courses

- Repetition and intensified teaching of all subjects of Basic and Advanced First Aid plus
- Structures and functions of the body (anatomy and physiology)
- Types of wounds
- Types of fractures
- Injuries caused by corrosives
- Transportation of casualties by standard and improvised means
- Elements of basic nursing
- Advanced teaching of shock prevention and treatment
- Assessment of situation at the scene of an accident
- Tactics of search, rescue, first aid and transport in cases of disaster
- Rules for co-operation with other agencies and organizations (fire brigade, police, armed forces, St Johns, etc.) in cases of disaster.

The fact that we have not elaborated on the skills and knowledge required of professional medical and para-medical staff in cases of disaster does not indicate that no additional training is needed. It is anticipated that suggestions will be brought forward from other sources.

All Red Cross Societies in the Caribbean Region have first aid training programmes. The contents vary but it would take little effort and encouragement to establish a regional training concept which would effectively meet the particular basic training requirements of people living in disaster prone areas, as well as of volunteers serving in medical disaster units.

ANNEX

## ADVANCED FIRST AID

The objective is to provide adults with a comprehensive course, teaching skills and knowledge necessary to deal with life threatening situations and other forms of physical distress.

### Content

Advanced teaching of the same content as in Basic First Aid, plus

- Head, neck, spine injuries
- Immobilization of fractures
- Wounds
- Burns
- Poisoning
- Chest and abdominal injuries
- Medical conditions
- Bandaging
- Calling for qualified aid
- Injuries due to heat and cold

It is strongly recommended that in both Basic and Advanced First Aid courses theoretical explanations are kept to the absolute minimum required whilst emphasis should be placed on practical exercises.

DOMINICA

WEST INDIES

# EXPERIENCES OF 1979 HURRICANES

# "DAVID" AND "FREDERIC"

Presented by: CURTIS J. LLOYD, Delegate
Government of Dominica

May 12, 1980

## WEATHER REPORTS (Radio Antilles)

By midday of 28th August, 1979, a hurricane warning was in effect for Barbados. Hurricane "David", described as one of the most dangerous for the century, was expected to hit Barbados at about midnight, August 28, 1979. Gale warnings had been issued in respect of Dominica and storm warnings for Martinique and St. Lucia.

By 10.00 p.m. on 28th August, 1979, it was known that David was threatening Martinique and would by-pass Barbados and St. Lucia. Storm warning was in effect for Dominica.

On 29th August, 1979, the 6.00 a.m. Antilles weather report indicated that "David" had changed course slightly and that the centre was expected to pass ovr Dominica about midday of that date. The Dominica Broadcasting Service gave very much the same information in the 7.15 a.m. weather report.

Later reports advised that the hurricane posed no direct threat to Martinique and/or St. Lucia. There was no mention of the situation with regard to Dominica and residents could not determine whether or not hurricane David was still headed for Dominica.

Hurricane warnings received at Melville Hall Airport on the afternoon of 28th August were transmitted to Roseau by telephone. However, later warnings could not be transmitted as the communications link between Melville Hall and the city had been broken down.

In terms of hurricane David, therefore, Dominicans were not given sufficient advance warning and were generally unprepared for the onslaught. As a consequence of this state of unpreparedness the population was not able to seek refuge in emergency shelters.

## SHELTERS

Government schools and churches throughout the island have always been regarded as the safest buildings in which to weather the high winds of a hurricane. This is probably because they are generally the most spacious structures in our communities. However, judging by the number of schools which were destroyed and the number of churches which suffered severe damages, it can be argued that the insufficiency of the warning (information) might have actually saved several lives.

Can we then deduce that timely warnings have no value in disaster preparedness? How will the population react if an when timely warnings are issued in future? Will they be ignored in the light of the "David" experience? To answer these questions one has to view David for the unique experience that it has been. Although there is reason to suspect that some designated hurricane shelters were definitely unsafe, what buildings could really have withstood the onslaught of near 200 m.p.h. winds? It can be argued that, had the highest winds persisted for another 15 minutes, Dominica might well have been blown off the face of the earth.

What is certain, however, is that adequate warning would have given the population time to secure stocks of food, water, fuel and medicines for the early part of the post hurricane period.

## E.O.C./EMERGENCY OPERATIONS CENTRE

It is normal for the Central Hurricane Committee to meet immediately prior to the hurricane season to set up Local Relief Committees, to identify emergency shelters and to review th action plan for preparedness (disaster). No such meetings took place during 1979 as all interest was directed towards re-organization following the political crisis of May-June 1979.

On the evening prior to Hurricane David the Minister of Home Affairs gave an address on local radio requesting that safety precautions be taken by the population and indicating the location of emergency shelters where people would be required to congregate in the event that the island was struck. It is to be mentioned here that these buildings are not generally equipped with water supplies, medical supplies, food or other requisites connected with disasters or relief. At About 3.00 a.m. of 29th August persons in the south of the island (Soufriere and Scott's Head, Grand Bay) were alerted when it was reported that "David" was heading for Martinique and St. Lucia and it was then known that that section of Dominica would have been affected because of its proximity to Martinique and St. Lucia. This alert was channelled through the Police Communications network.

At about 9.30 - 10.00 a.m. on 29th August, just prior to the hurricane, and when it was quite evident that Dominica would have been struck, a meeting of the Central Hurricane Committee was convened at Government Headquarters at which meeting it was decided that the Emergency Operations Centre would be set up at Police Headquarters. During the course of the meeting the hurricane force winds started.

So hurricane "David" blasted Dominica for some 6 to 7 hours and left a toll of some 40 dead an several injured in its wake. The loss of personal property (buildings, etc.) was phenomenal and the entire agricultural base was destroyed. All communications were destroyed also. At the end of it all one got the impression that a huge fire had raged through the island and razed everything to the ground.

It was only at about 5.30 to 6.00 p.m. that people generally started moving out of houses (at least in Roseau).

Soon after the passage of the hurricane the Central Hurricane Committee met to set up action groups to perform specific tasks. The first task of the Central Hurricane Committee was to seek out sound buildings and those not too badly damaged to be used as relief centres. This proved more difficult than would have been expected because many of the designated emergency shelters were themselves destroyed. It is assumed that similar action was taken up to the Hospital which was itself extensively damaged and it was later decided to use Government Headquarters as a relief centre for treatment of the injured.

With many persons homeless the population of Roseau crowded around Police Headquarters and Government Headquarters, causing traffic bottlenecks. The situation was made more chaotic with nightfall and the total absence of electricity. The homeless sought refuge in storerooms, cellars and the Emergency Operating Centre, in fact, wherever there was the semblance of a roof. Few slept on that night.

## COMMUNICATIONS

The first news of the hurricane to the outside world was transmitted by a ham radio operator who continued operating throughout the hurricane.

On 30th August, a.m. 1979 the H.M.S. Fife (British warship) arrived in Port and transmitted the first S.O.S. for assistance to Dominica. The Fife personnel set up the makings of an office at Police Headquarters and established a radio communications link between that office and the battleship. The Venezuelan Army came in later and set up a network tying in the Melville Hall Airport, Police Headquarters and Venezuela.

With all roads being blocked messengers came in to Roseau by foot over long distances to report deaths and injuries from their areas. The local population all over the country played a major part in clearing of roads to allow movement of relief supplies and personnel throughout the island.

The hurricane warnings did not allow sufficent time for the deployment of heavy equipment and transport vehicles to strategic areas. However, personnel from H.M.S. Fife got down immediately to the task of clearing roads in Roseau to allow for movement of vehicles in the city. In the meantime helicopters from the Fife and later, the French and U.S., assisted in transporting medical and nursing personnel and relief suplies to blockaded areas during the first days following "David".

The second major task on Day 2 was locating local food supplies. This tasks was made more difficult because of extensive looting taking place at the time. Some food stores were located and taken over but later in the post hurricane period all food supplies arriving in Dominica were taken over by Government for relief purposes.

## TASK FORCES

The third day following the hurricane saw task forces being set up to carry out surveys and ensure that basic services were functioning. The Health Sector was the first to get off the ground for general co-ordination of the health services - (treatment of injured persons, sanitary services, checking water supplies). In this respect we owe our thanks to the CARICOM Secretariat, PAHO/WHO, friendly governments and organizations (Int. Red Cross) who supplied valuable technical and professional asistance, drugs etc. The fact that no serious epidemics occured after "David" attests to the efficiency of the Health Sector operations.

The Agricultural sector was the quickest to recover and marshall its manpower resources as those were locally available. The then Minister of Agriculture was a dynamic force in leading this recovery. Agricultural surveys etc. were undertaken and within a few days the Department was able to submit a comprehensive Emergency Food Production Plan aimed at supplying short-term agricultural produce after a six month period.

## DISASTER ASSISTANCE

Overseas disaster assistance personnel started to arrive in large numbers by the fourth day and this continued for the follwing two weeks. This large influx of persons added to the general confusion because of the lack of accommodation, shortage of food and water and lack of essential services. As there was not yet at the time a central structure set up to handle this situation, chaos ensued and members of some of those organizations got lost in the confusion. It must be recorded also that local personnel were not generally and freely available as they had to take care of their own personal problems. The impression created was that even the trained disaster assistance personnel were at first as confused as Dominicans as they had not previously encountered devastation of such a magnitude.

To add to the general confusion of the early post David days there was also a great influx of tourist type visitors and other freebooters, including confidence tricksters, who occupied too much of the little hotel accommodation available.

While a lot of attention was being paid to other aspects of relief, the organization for receiving critical supplies (drugs, food etc.) was not functioning satisfactorily mainly because of lack of experience in these matters of the personnel involved. As a result of this setback some early relief supplies did not reach the target population.

One of the main criticisms of the organization at the Emergency Operations Centre was that specialized personnel were allocated trival jobs which could be performed by non specialists--a great waste of talents.

A criticism of relief organizations and overseas groups is that too much used clothing was sent in, taking up valuable storage space.

LESSON LEARNED

One of the most urgent considerations for Dominica must be the need to carry out a survey of th designated emergency shelters with a view to updating and/or replacing the weaker structures. There is also the need to institute a building code to include safety standards for construction. All emergency shelters should be equipped with a good water supply, preferably with an independent cistern, a supply of food, basic emergency drugs, first aid and fuel supplies and radio telephone link with the emergency operations centre prior to and throughout the hurricane season.

Another obvious priority is a good radio telecommunications network with the main station based at Emergency Headquarters and linked not only with emergency shelters in population centres throughout the island but also to a regional network for ensuring constant contact and up-to-date information on disasters, for improving early warning systems and disseminating information to the general public. At the 19th Meeting of the Caribbean Meteorological Council held in Castries, St. Lucia, on 13th December, 1979, delegates emphasized the need for longer advance warning of hurricanes--at least 40 hours. It is hoped that Governments in the region will improve the meteorological systems to meet this criterion.

I have already indicated that an amateur radio operator was the first person to bring our plight to the attention of the outside world. Governments should give every encouragement and assistance possible to amateur radio clubs/organizations and seek to heighten their awareness of the important role they can play in disaster preparedness and relief operations throughout the region.

Prior to the hurricane season and certainly as soon as hurricane warnings are given, heavy equipment, transport vehicles and fuel supplies should be deployed to strategic areas in the country so that the clearing of roads, landslides, etc. can be effected speedily to allow for quick movement of injured persons and relief supplies.

In areas which have escaped natural disasters for long periods people tend to be lackadaisical about advance warnings. This was the situation in Dominica when hurricane "David" struck. Public awareness of possible disasters should be maintained, disaster preparedness education should be continuous and should be the responsibility of Government. Annual disaster drills can go a long way towards lessening the panic which is likely to be caused when disaster strikes.

No programme of disaster preparedness would be complete without adequate training. Medical and nursing personnel, first aid, engineering, logistics experts etc., must receive adequate training in such matters so that they may be able to deal adequately with disaster relief efforts.

One of the aspects given very little attention when disaster strikes is the area of security. The widespread looting which occurred following hurricane "David" points to the necessity of assuring that this critical area must be adequately and efficiently manned to protect relief supplies and private and public property against undue wastage and vandalism.

It is said that experience is the best teacher. Even as we hope never again for a repeat performance, let us hope that the lessons we have been taught by hurricanes "David" and "Frederic" will not have been lost upon us.

## Caribbean Disaster Preparedness: A Summary

This review of disaster preparedness in the Caribbean is based on planning group discussions, team reports and related special reports on health and meteorology. In order to provide continuity for the project development effort, the data has been organized according to the project areas chosen for committee consideration.* Some sections of this review are more complete than others, because the information base was more complete for given subject areas in some countries than others. (For example, Dr. Volvick Joseph's special report on health addressed the Cayman Islands, Grand Turk, Haiti and the Dominican Republic.) References made to specific countries ought not to be taken as criticisms or endorsements of a particular country's endeavors. Rather, these examples should be viewed as illustrative of the general level of Caribbean disaster preparedness.

* I. Communications
II. Meteorology
III. Preparedness Planning
IV. EOC Management
V. Public Awareness
VI. Seismology (Earthquakes, Volcanoes; Disaster-Resistant Housing)
VII Disaster Medical Care
VIII. First Aid Training
IX. Non-governmental Organization Disaster Preparedness Activity
X. Other Regional Activities
XI. Special Country Projects

## I. Communications

Kenrick Leslie's special report on the level of preparedness of meteorological services in the Central and Western Caribbean provided detailed information on communication facilities in this geographic area.[1] Belize, the Bahamas and the Dominican Republic[2] have the capability to adequately warn most of their people. In the Dominican Republic, emergency communications coverage was good in the capital, less effective in the countryside. Volag programs are directed at the rural population (which is not covered by commercial radio). However, the report suggested that certain links within country communications networks were potential problems. For example, in the Bahamas, though the reliability of the communications linkage between the Central Forecasting Centre in Nassau and the Regional Hurricane Center in Miami is reportedly good, the national telephone system, which functions as a link between the Central Forecasting Center in Nassau and the other islands, could become saturated when information is most needed. An independent system would be more suitable for this warning function. However, existing linkages between the country's several independent systems are not well-defined. In Belize, the link between the Forecasting Office and the countrywide network of observing stations did not prove reliable in the last hurricane emergency, though connections between the office and the radio station were.

Although Haiti and the Cayman Islands lack their own detection and tracking systems (see Meteorology), they have established links with other offices with such facilities, and are thus able to receive warnings (from the U.S. National Weather Service and Jamaica's National Meteorological Office).

In Haiti, low radio ownership limits the effectiveness of any public information network.

The Turks and Caicos Islands have neither a national meteorological service nor an established association with an external meteorological organization. The U.S. Navy and Air Force facility, closing in 1980, formerly was a potential source of warnings. The new radio station does not reach all islands.

With regard to the Eastern Caribbean (Antigua, Barbados, Dominica, Grenada, Montserrat, St. Kitts, St. Lucia and Trinidad), the team recommended an immediate evaluation of the communications systems. Barbadian officials were particularly concerned about upgrading their already good communications network. Although Montserrat has communications links with police stations on the island, they are presently not in working order. The St. Kitts emergency communications system includes connections to some police stations outside of Basseterre, Nevis, but not to Anguilla or to hospital and fire installations. In both Grenada and Dominica, no network was in existence.

From this brief review of emergency communications preparedness, it is clear that even the best-equipped islands would benefit from certain improvements. Some countries might require the installation of a complete communications system.

1) Belize, Bahamas, the Caymans , Dominican Republic, Haiti, Turks and Caicos
2) though commercial radio systems do not cover entire territory

## II. Meteorology

Again, Leslie's report on the level of preparedness of meteorological services in the Central and Western Caribbean is the source of most of the information that follows. Team reports also covered this aspect of disaster preparedness.

The existing network of observing stations in Belize is sufficient for the present needs of the country. The routine operations of the Forecasting Centre provide enough information to detect and track storms occurring within the Caribbean Basin. In the Bahamas, although the present meteorological network appears adequate, disaster readiness in the outer islands could be improved by installing automatic stations to monitor the state of the sea. The Dominican Republic's meteorological facilities also met country needs; however, flood forecasting capability would benefit from direct communication between the Meteorological and Hydrological Services. Haiti, the Caymans, and the Turks and Caicos Islands do not have meteorological services with detecting and tracking facilities, although Haiti and the Caymans have formed associations with other offices offering such services.

The team reports for the Eastern Caribbean do not cover the meteorological sector in enough detail to indicate the level of preparedness in individual countries. However, the information contained in the Central and Western Caribbean Report suggests a need for improvements in and in some cases establishment of meteorological networks. Hydrological considerations also need to be integrated into these networks in areas vulnerable to flooding (Dominican Republic, Jamaica, Haiti, Barbados, most of the Lesser Antilles).

## III. Preparedness Planning

The state of the country's disaster plan was viewed as an indicator of the state of preparedness in individual Caribbean countries. Most Caribbean countries have disaster plans; however, they generally address only one type of disaster, hurricanes. Only the Dominican Republic, Barbados and Grenada have plans which consider other disaster types.

In the survey of the northern Caribbean countries, another problem surfaced. While most of the governments visited indicated that national plans existed, the team members were only able to obtain a copy of the Belize plan. Where no published plans could be located, the team concluded that problems may well exist in the implementation of the plan.

The teams also observed that several of the plans were not up to date. Neither St. Kitts nor St. Lucia had revised their plans recently, though revisions were planned.

It was noted by the Eastern Caribbean Team members that several plans were oriented primarily toward relief. Greater emphasis on disaster preparedness is needed.

## IV. EOC Management

(For analyses of specific components of an EOC, i.e., communications, health services, emergency supplies, etc., see appropriate sections).

Emergency Operations Centers exist in the majority of the Caribbean Islands. In some cases, as in the Cayman Islands, police headquarters are designated as the EOC and there is no permanent organization with a full-time staff. In most countries, the EOC staff performs disaster-related duties only during emergency situations. Procedures for activating the EOC when a disaster threatens are not always clear - the Bahamas appears to be a case in point.

The Eastern Caribbean Team commented on the structural soundness of EOC buildings. In Antigua, Montserrat and Dominica, the EOC's structural resistance to hurricanes or earthquakes was questioned.

Finally, a limited evaluation of the adequacy of personnel training was performed. Most islands would benefit from improved programs; several governments identified personnel training as a high-priority need.

## V. Public Awareness

Team comments on public awareness should be taken in the context of limited opportunity for observation and discussion during their visits. Increased public awareness is a high priority need for many of the Caribbean governments contacted. To a certain extent, public awareness is dependent on the status of the various communications networks (see Communications) and, in practice, on the recent occurence of disasters.

In Belize, the National Meteorological Service directs a year-round public education campaign. Schools, government agencies, and private businesses participate with lectures, exhibitions, movies, newspaper articles, posters, pamphlets and even open-house days at radar stations. In the Bahamas, there is a more limited effort, primarily in collaboration with radio and T.V. stations during the hurricane season.

With regard to the Eastern Caribbean, the team recommended several public awareness projects, perhaps influenced by the lack of preparedness for hurricane David. Since the 1970's were relatively disaster-free, public awareness is not at the optimum level for adequate disaster preparedness in these countries. For example, a National Disaster Day was suggested for St. Lucia, and radio broadcasts of public awareness programs were proposed for Dominica.

## VI. Seismology (Earthquakes, Volcanoes)

Neither team focussed explicitly on seismology. Because most plans do not address seismic threat and because the interval between earthquakes and volcanic eruptions is far greater than that for tropical cyclones or floods, it is probable that the level of preparedness is very low in this area. Barbados, Grenada, and St. Kitts cited U.W.I. as a source of seismic risk evaluation and monitoring; St. Lucia and Antigua referred these roles to unspecified regional organizations.

## VII. Disaster Medical Care

A special report on Health for the Cayman Islands, Grand Turk, Haiti and the Dominican Republic contains some valuable insights into the level of emergency medical care. Both teams also reviewed the health situation as part of their assessments.

Few countries have separate disaster plans in the health sector or for hospital facilities. The Dominican Republic, Cayman Islands, Grand Turk, and Haiti were deficient in this respect. Both the Dominican Republic and Grand Turk had a checklist for action to be taken and resources to be made available at health centers or an easily located central point.

Although Antigua did have a hospital disaster plan, emergency supplies were limited. Likewise, St. Kitts and the Cayman Islands do not maintain adequate emergency medical supplies.

In the Cayman Islands and Grand Turk, Haiti, and the Dominican Republic, emergency room equipment is insufficient and ambulance services would not meet the demand in an emergency. Also emergency training for medical personnel in these countries is lacking.

These observations suggest that while the basic institutional framework exists for emergency medical care, it is necessary to augment medical resources and train medical personnel for emergency situations.

## VIII. First Aid Training

First aid training was available in about half of the countries surveyed. Refresher courses were suggested.

## IX. Non-Governmental Organization Activities

NGO's, voluntary agencies and service organizations play an active role in the disaster relief activities of most Caribbean countries. The Red Cross, the St. John's Ambulance Service (in English-speaking areas), various church groups and international voluntary agencies may provide planning expertise, operations staff and relief supplies and services and are often integrated into country plans. Projects should make the best possible use of trained or experienced personnel; training projects for NGO's were suggested by both teams and countries.

## X. Other Regional Activities

Possibilities for participation in or use of existing regional programs have not always been fully investigated by individual countries. Most Caribbean countries do not have the resources on a national level for extensive mitigation and prevention programs in the areas of risk mapping and zoning, building standards development and hazard monitoring. Regional organizations, e.g. U.W.I., in some cases already have programs which could be extended to include vulnerable areas not already covered.

## XI. Special Country Projects

Special conditions, in the physical environment, for example, may create unique disaster preparedness needs in some countries. It may be advantageous to discuss project possibilities for such situations in the regional forum this conference provides.

## IN-COUNTRY SELF-AUDITS

### DISASTER PLAN

| Island Name | up to date | for all disasters | only for hurricanes | emer. op. center | district organ. | periodic updating | periodic testing | warnings/ advisories | search & rescue | areas for improvement/comment |
|---|---|---|---|---|---|---|---|---|---|---|
| A | yes | no | yes | yes | yes+ | yes (annual) | no | yes | no | plan/central emergency org. in developmental stage |
| B | | yes | no | yes | yes | no | no | yes | no | urgent need to implement national emergency plan |
| C | yes | no | no | no | no | yes | no | yes | no | |
| D | yes | no | yes | yes | yes | yes | no | yes | no | need equipment, training, and testing |
| E | no | no | yes | no | no+ | no | no | yes | no | plan being redrafted; no copy available |
| F | no | no | yes | yes | yes | no | no | yes | no | 1974 plan under revision |
| G | yes | no | yes | no+ | no | yes | no | yes | no | Ministry, Hospital and Airport plans |
| H | no | no | yes | no | yes | yes | yes | yes | yes | Cabinet Office coordinates; specialized public and private sector plans |
| I | yes | yes | no | yes | yes | yes (annual) | yes (annual) | yes | yes | |
| J | yes | no | yes | yes | yes | yes | yes | yes | yes | plans tested and in use on all levels |
| K | yes | yes | yes | yes | yes | yes | yes | yes | yes | public and private sector plans |

+ but police headquarters is designated emergency operations center