


MINUTES OF MEETINGS  
BETWEEN  
THE JAPANESE PREPARATORY STUDY TEAM  
AND THE AUTHORITIES CONCERNED  
OF THE GOVERNMENT OF BARBADOS AND CDERA  
ON JAPANESE TECHNICAL COOPERATION  
FOR THE CARIBBEAN DISASTER MANAGEMENT PROJECT PHASE 2

The Japanese Preparatory Study Team (hereinafter referred to as "the Team"), organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Satoru Mimura, visited Barbados from November 25 to November 28, 2007 and December 10 to December 12, 2007 for the purpose of working out the details of the technical cooperation program concerning the Caribbean Disaster Management Project Phase 2 (hereinafter referred to as "the Project").

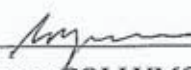
During its stay in Barbados, the Team had a series of discussions with officials of the Ministry of Foreign Affairs and Foreign Trade and Caribbean Disaster Emergency Response Agency (hereinafter referred to as "CDERA").

As a result of these discussions, each side agreed to report to their respective government the matters referred to in the document attached hereto.

Bridgetown, December 10, 2007

  
\_\_\_\_\_  
Mr. Satoru MIMURA  
Leader,  
Japanese Preparatory Study Team,  
Japan International Cooperation Agency,  
Japan

  
\_\_\_\_\_  
Ms. Teresa MARSHALL  
Permanent Secretary  
Ministry of Foreign Affairs and  
Foreign Trade  
Barbados

  
\_\_\_\_\_  
Mr. Jeremy COLLYMORE  
Coordinator,  
Caribbean Disaster Emergency Response Agency

Each side agreed to the matters concerned listed below.

#### I. Basic Framework of the Project

The basic framework of the Project is as follows:

##### 1. Title of the Project

The Title of the Project will be changed to “**Caribbean Disaster Management Project Phase 2**” from the original title in the Application form for Japan’s technical cooperation, “Expansion of Caribbean Disaster Management Project Enhancing Flood Hazard Mapping and Community-based Disaster Planning in CDERA Participating States” after going through the necessary procedure of both sides.

##### 2. Overall Goal

Disaster damages in CDERA Participating States are mitigated through Enhancement of Community Resilience to the flood hazard

##### 3. Project Purpose

Capacity of CDERA and five pilot states for managing the flood hazard is increased

##### 4. Outputs of the Project

- (1) Early Warning Systems for the flood hazard established and implemented at the pilot sites
- (2) Capability of the Regional team to develop flood hazard maps and to establish flood early warning systems upgraded
- (3) Hydrological database is established and functioning at the Caribbean Institute of Meteorology and Hydrology (CIMH)

##### 5. Activities of the Project

- (1.1) Procurement and installation of hydrological and meteorological observation equipment and start of observation at the five (5) pilot sites. (Including telemetry systems for large basins in Guyana and Belize)
- (1.2) Development of GIS database at the five (5) pilot sites
- (1.3) Flood analysis at the five (5) pilot sites

  
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- (1.4) Preparation of flood hazard maps for each of the five (5) pilot sites showing inundation areas, shelters, evacuation routes etc.
- (1.5) Information Collection on the communities at the five (5) pilot sites for preparing CDM plans
- (1.6) Preparation of CDM plans at the five (5) pilot sites
- (1.7) Establishment of flood early warning system at the five (5) pilot sites
- (1.8) Disaster evacuation training at the five (5) pilot sites based on the CDM plan
- (1.9) Implementation of Disaster Imagination Game (DIG) at the pilot sites
- (1.10) Training in Japan of the NTs counterparts about hydrological observation and CDM plan

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- (2.1) Revision of the manual for flood hazard mapping prepared in Phase1 based on the result of activities at the five (5) pilot sites (Including the establishment of cartographic standards for Flood Hazard Mapping)
- (2.2) Revision of the manual for CDM plan prepared in Phase1 based on the result of activities at the five (5) pilot sites
- (2.3) Preparation of the manual for flood early warning system
- (2.4) Hold workshops and seminars on flood early warning system
- (2.5) Training in Japan of the RT and/or NT counterparts in flood hazard mapping, CDM planning, flood early warning systems and DIG facilitation

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- (3.1) Evaluation of the status of hydrological data collection and management
- (3.2) Development of a web-based data collection, management and dissemination program
- (3.3) Procurement and installation of the computer equipment, software and peripherals for collection and dissemination of hydrological data at the regional and national levels
- (3.4) Training on input and dissemination of hydrological data at the regional and national levels

**6. Pilot Project Site Selection**

- (1) Belize

  
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- (2) Dominica
- (3) Grenada
- (4) Guyana
- (5) Saint Lucia

Detailed activities at the each pilot site will be determined after the commencement of the project, carefully considering the flood situation at each site.

**7. Duration of the Project**

The duration of the Japanese technical cooperation for the Project shall be three (3) years. The starting date of the Project will be fixed later.

**II. Measures to be taken by the Government of Japan**

**1. Dispatch of long-term experts;**

Expert on Disaster Information Management and Project Administration

**2. Dispatch of Short-term experts**

- (1) Expert on flood analysis
- (2) Expert on flood hazard mapping and flood early warning system
- (3) Expert on CDM planning
- (4) Expert on hydrological Database
- (5) Expert on Disaster Imagination Game (DIG)

**3. Training of counterpart personnel in Japan;**

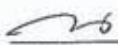
Counterpart personnel will be trained in Japan. The number of trainees and training periods shall be determined annually according to the mutual consultation.

**4. Provision of Equipment**

The Government of Japan will provide machinery, equipment and other materials necessary for the implementation of the Project.

**III. Measures to be taken by the Government of Barbados and CDERA**

**1. Assignment of counterpart personnel**

  
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CDERA will assign a sufficient number of counterpart personnel from itself or from other organizations such as Caribbean Institute of Meteorology and Hydrology (CIMH), University of the West Indies (UWI) and National Disaster Organizations (NDOs).

**2. Provision of the office**

CDERA will provide the office with equipment (desk, air conditioner, telephone, etc.) for the Project.

**3. Budget allocation**

CDERA will bear the operational expenses necessary for the implementation of the Project, including expenses for transportation of equipment within the CDERA member states as well as for their installation, operation and maintenance.

**4. Exemption of customs duties, internal taxes etc**

All Project equipment and activities will be undertaken within the arrangement of the CDERA Headquarters Agreement with the Government of Barbados.

**5. Accommodation**

The Government of Barbados and CDERA will engage in discussion on the interventions necessary to accommodate the Project Team and activities for the smooth implementation of the Project.

**IV. Administration of the Project**

**1. Joint Coordinating Committee**

**(1) Functions**

The Joint Coordinating Committee (hereinafter referred to as the "JCC") will be set up to promote effective technical cooperation under the Project. The JCC will meet at least once a year, and whenever necessary, in order to fulfill the following functions:

- I. To review the progress of activities implemented under the annual work plan;
- II. To review and exchange opinions on major issues that may arise

  
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during the implementation of the Project; and

III. To discuss any other issue(s) pertinent to the smooth implementation of the Project.

(2) Composition

I. Chairperson: Coordinator of CDERA

II. Member organization

- a. Ministry of Foreign Affairs and Foreign Trade, Barbados
- b. CIMH
- c. UWI
- d. NDOs
- e. Japanese experts
- f. Official(s) of the Embassy of Japan in Trinidad and Tobago and other personnel concerned to be assigned by JICA, if necessary.

2. **Project Director**

Coordinator of CDERA will bear overall responsibility for the administration and implementation of the Project as the Project Director.

3. **CDERA Programme Manager**

The Programme Manager of CDERA will be responsible for the managerial and technical matters pertaining to the Project.

V. **Project Design Matrix (PDM)**

The tentative Project Design Matrix (PDM) was established as shown in ANNEX I, based on the request of CDERA and its member states and considering the result of Caribbean Disaster Management Project (Phase 1).

VI. **Plan of Operation (PO)**

The tentative Plan of Operation is shown in ANNEX II.

  
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ANNEX 1 Tentative Project Design Matrix (PDM)

ANNEX 2 Tentative Plan of Operation (PO)

ANNEX 3 Draft of Record of Discussions

  
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PROJECT DESIGN MATRIX

Project Name: Caribbean Disaster Management Project Phase 2  
 Implementing Agency: The Caribbean Disaster Emergency Response Agency (CDERA)  
 Duration: From July 2008 to June 2011  
 Prepared on: 28 November 2007

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p>(Super Goal)                      Disaster damage in CDERA member states is mitigated</p> <p>(Overall Goal)                      Disaster damages in CDERA Participating States are mitigated through Enhancement of Community Resilience to the flood hazard.</p> <p>(Project Purpose)                      Capacity of CDERA and five pilot states for managing the flood hazard is increased.</p>	<p>Annual number of affected persons in CDERA member states will become under a targeted number.                      Annual amount of property/business losses in CDERA member states will become under a targeted amount.</p> <ul style="list-style-type: none"> <li>- Among the disaster-prone areas in CDERA member states, for areas of more than % hazard maps are prepared.</li> <li>- Among the disaster-prone areas in CDERA member states, for more than % CDMP are prepared.</li> <li>- At more than half of the pilot sites, RT-made hazard maps and CDMPs are prepared and flood early warning systems are developed.</li> <li>- Sustainability Plan of RT and NT for maintaining the technical capacity and organizational system</li> </ul>	<p>Damage information in CDERA member states</p> <ul style="list-style-type: none"> <li>- CDERA's Annual Reports</li> <li>- Interview to CDERA and member states</li> </ul> <p>Project Reports                      Sustainability Plan</p>	<ul style="list-style-type: none"> <li>- Comprehensive Disaster Management (CDM) Strategy is implemented</li> </ul> <ul style="list-style-type: none"> <li>- Disaster Policies of the Caribbean Community are not largely changed.</li> <li>- CDERA and disaster agencies of member states are properly budgeted and staffed</li> <li>- No rapid change in natural environment occur.</li> </ul>
<p>(Outputs)                      1. Early Warning Systems for the flood hazard established and implemented at the pilot sites.</p> <p>2. Capability of the Regional team to develop flood hazard maps and to establish flood early warning systems upgraded.</p>	<p>1-1 Flood hazard maps are prepared at the pilot sites.</p> <p>1-2 CDMPs are prepared at the pilot sites.</p> <p>1-3 Flood early warning systems are established in the whole of the pilot sites.</p> <p>2-1. Flood Hazard Mapping Manual is revised more than once a year</p> <p>2-2. CDM Planning Manual is revised</p> <p>2-3 Manual for establishing flood early warningsystems is prepared and distributed to related agencies.</p> <p>2-4 Workshops for developing flood early warning system using hazard maps and CDMPs are held more than twice a year.</p> <p>2-5 Capacity of RT engineers for flood hazard mapping, CDMP preparation and establishment of flood early warning system is improved.</p> <p>3-1. Hydrological data base is established in CIMH.</p> <p>3-2. Web based-hydrological data collection, management and dissemination program is developed.</p> <p>3-3. Hydrological data is supplied from CDERA member states through the program more than OO times a year.</p> <p>3-4. The hydrological data base through the program is accessed by CDERA member states more than OO times a year.</p>	<p>1-1 Project Reports</p> <p>1-2 Project Reports</p> <p>1-3 Project Reports</p> <p>2-1 Revised Manual</p> <p>2-2 Revised Manual</p> <p>2-3 Project Reports</p> <p>2-4 Project Reports</p> <p>2-5 Interview to RT counterparts</p> <p>3-1 Confirmation at CIMH</p> <p>3-2 Confirmation of Web</p> <p>3-3 Data of CIMH</p> <p>3-4 Data of CIMH</p>	<ul style="list-style-type: none"> <li>- Counterparts who received technology transfer continue to stay in CDERA, RT and NT.</li> </ul>
<p>3. Hydrological database is established and functioning at the CIMH.</p>			

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
<p>(Activities)</p> <p>1.1 Procurement and installation of hydrological and meteorological observation equipment and start of observation at the five (5) pilot sites (including telemetry systems for large basins in Guyana and Belize)</p> <p>1.2 Developments of GIS database at the five (5) pilot sites.</p> <p>1.3 Flood analysis at the five (5) pilot sites.</p> <p>1.4 Preparation of flood hazard maps for each of the five (5) pilot sites showing inundation areas, shelters, evacuation routes etc.</p> <p>1.5 Information Collection on the communities at the five (5) pilot sites for preparing CDM plans.</p> <p>1.6 Preparation of CDM plans at the five (5) pilot sites</p> <p>1.7 Establishment of flood early warning systems at the five (5) pilot sites.</p> <p>1.8 Disaster evacuation training at the five (5) pilot sites based on CDM plan.</p> <p>1.9 Implementation of Disaster Imagination Game (DIG) at the pilot sites.</p> <p>1.10 Training in Japan of the NTs counterparts about hydrological observation and CDM plan plan.</p> <p>2.1 Revision of the manual for flood hazard mapping prepared in Phase 1 based on the result of activities at the five (5) pilot sites (including the establishment of cartographic standards for Flood Hazard Mapping)</p> <p>2.2 Revision of the manual for CDM plan prepared in Phase 1 based on the result of activities at the five (5) pilot sites.</p> <p>2.3 Preparation of the manual for flood early warning system.</p> <p>2.4 Hold workshops and seminars on flood early warning system.</p> <p>2.5 Training in Japan of the RT and/or NT counterparts in flood hazard mapping, CDM planning, flood early warning systems and DIG facilitation.</p> <p>3.1 Evaluation of the status of hydrological data collection and management</p> <p>3.2 Development of a web-based data collection, management and dissemination program.</p> <p>3.3 Procurement and installation of the computer equipment, software and peripherals for collection and dissemination of hydrological data at the regional and national levels.</p> <p>3.4 Training on input and dissemination of hydrological data at the regional and national levels.</p>	<p>(Input)</p> <p>Japanese side</p> <ul style="list-style-type: none"> <li>• Dispatch of short-term experts (Flood analysis, Hazard mapping, GIS, Data base management, DIG, dispatched when necessary)</li> <li>• Training of counterpart personnel in Japan(5-6 persons annually)</li> <li>• Provision of equipment (Observation equipment, Data base related equipment, etc)</li> </ul> <p>CDERA,side</p> <ul style="list-style-type: none"> <li>• Assignment of counterpart personnel (RT,NT)</li> <li>• Provision of the office and facilities for the Japanese experts</li> </ul> <ul style="list-style-type: none"> <li>• CDERA (Caribbean Disaster Emergency Response Agency)</li> <li>• CIMH</li> <li>• UWI Trinidad &amp; Tobago</li> <li>• UWI Jamaica</li> </ul> <p>National Team (Disaster agencies of pilot countries and Communities of pilot sites)</p> <ul style="list-style-type: none"> <li>• Dominica</li> <li>• St. Lucia</li> <li>• Grenada</li> <li>• Guyana</li> <li>• Belize</li> </ul>	<p>(Pre-Conditions)</p> <ul style="list-style-type: none"> <li>• Counterparts are assigned as planned and scheduled</li> <li>• Project budget is allocated as planned and scheduled.</li> </ul>	

RECORD OF DISCUSSIONS  
 BETWEEN  
 THE JAPANESE IMPLEMENTATION STUDY TEAM  
 AND  
 THE AUTHORITIES CONCERNED OF  
 THE GOVERNMENT OF BARBADOS AND CDERA  
 ON  
 JAPANESE TECHNICAL COOPERATION  
 FOR  
 THE CARIBBEAN DISASTER MANAGEMENT PROJECT PHASE2

The Japanese Implementation Study Team (hereinafter referred to as “the Team”), organized by the Japan International Cooperation Agency (hereinafter referred to as “JICA”) and headed by \_\_\_\_\_, visited Barbados from \_\_\_\_\_ to \_\_\_\_\_, for the purpose of working out the details of the technical cooperation program concerning the Caribbean Disaster Management Project Phase2 (hereinafter referred to as “ the Project”) in Barbados.

During its stay in Barbados, the Team exchanged views and had a series of discussions with the officials of the Ministry of Foreign Affairs and Foreign Trade, CDERA staff and representatives of several member states and universities with respect to desirable measures to be taken by the Governments/Organizations concerned for the successful implementation of the above-mentioned Project.

As a result of the discussions, the Team and the Governments/Organizations concerned agreed to recommend to their respective Governments/Organizations the matters referred to in the document attached hereto.

Bridgetown, April 2008

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Mr.  
 Leader,  
 Japanese Implementation Study Team,  
 Japan International Cooperation Agency,  
 Japan

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Ms. Teresa MARSHALL  
 Permanent Secretary,  
 Ministry of Foreign Affairs and  
 Foreign Trade,  
 Barbados

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Mr. Jeremy COLLYMORE  
 Coordinator,  
 Caribbean Disaster Emergency  
 Response Agency

## THE ATTACHED DOCUMENT

## I. COOPERATION BETWEEN BOTH GOVERNMENTS

1. The Government of Barbados will implement the Caribbean Disaster Management Project Phase2(hereinafter referred to as “the Project”) in cooperation with the Government of Japan.
2. The Project will be implemented in accordance with the Master Plan which is given in Annex I.

## II. MEASURES TO BE TAKEN BY THE GOVERNMENT OF JAPAN

In accordance with the laws and regulations in force in Japan, the Government of Japan will take, at its own expense, the following measures through JICA according to the normal procedures under the Technical Cooperation Scheme of Japan.

## 1. DISPATCH OF JAPANESE EXPERTS

The Government of Japan will provide the services of the Japanese experts as listed in Annex II.

## 2. PROVISION OF MACHINERY AND EQUIPMENT

The Government of Japan will provide such machinery, equipment and other materials (hereinafter referred to as “the Equipment”) necessary for the implementation of the Project as listed in Annex III. The Equipment will become the property of the Government of each country concerned upon being delivered C.I.F. (cost, insurance and freight) to authorities of each country concerned at the ports and/or airports of disembarkation.

## 3. TRAINING OF BARBADIAN PERSONNEL IN JAPAN

The Government of Japan will receive the Barbadian personnel connected with the Project for technical training in Japan.

## III. MEASURES TO BE TAKEN BY THE GOVERNMENT OF BARBADOS

1. The Government of Barbados will take necessary measures to ensure that the self-reliant operation of the Project will be sustained during and after the period of Japanese technical cooperation, through full and active involvement in the Project by all related authorities, beneficiary groups and institutions.
2. The Government of Barbados will ensure that the technologies and knowledge acquired by the Barbadian nationals as a result of Japanese technical cooperation will contribute to the economic and social development of Barbados.

3. The Government of Barbados will grant in Barbados privileges, exemptions and benefits as listed in Annex IV and will grant privileges, exemptions and benefits no less favorable than those granted to experts of third countries or international organizations performing similar missions to the Japanese experts referred to in II-1 above and their families.
4. The Government of Barbados will ensure that the Equipment referred to in II-2 above will be utilized effectively for the implementation of the Project in consultation with the Japanese experts referred to in Annex II.
5. The Government of Barbados will take necessary measures to ensure that the knowledge and experience acquired by the Barbadian personnel from technical training in Japan will be utilized effectively in the implementation of the Project.
6. In accordance with the laws and regulations in force in Barbados, the Government of Barbados will take necessary measures to provide at its own expense:
  - (1) Services of the Barbadian counterpart personnel and administrative personnel as listed in Annex V;
  - (2) Land, buildings and facilities as listed in Annex VI;
  - (3) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the Equipment provided through JICA under II-2 above ;
  - (4) Means of transport and travel allowances for the Japanese experts for official travel within Barbados; and
  - (5) Suitably furnished accommodations for the Japanese experts and their families.
7. In accordance with the laws and regulations in force in Barbados, the Government of Barbados will take necessary measures to meet:
  - (1) Expenses necessary for transportation within Barbados of the Equipment referred to in II-2 above as well as for the installation, operation and maintenance thereof;
  - (2) Customs duties, internal taxes and any other charges imposed in Barbados on the Equipment referred to in II-2 above; and
  - (3) Running expenses necessary for the implementation of the Project.

#### IV. ADMINISTRATION OF THE PROJECT

1. Coordinator of CDERA, as the Project Director, will bear overall responsibility

for the administration and implementation of the Project.

2. Senior Project Officer of CDERA, as the Project Manager, will be responsible for the managerial and technical matters of the Project.
3. The Japanese experts will provide necessary recommendations and advice to the Project Director and the Project Manager on any matters pertaining to the implementation of the Project.
4. The Japanese experts will give necessary technical guidance and advice to the Barbadian counterpart personnel on technical matters pertaining to the implementation of the Project.
5. For the effective and successful implementation of technical cooperation for the Project, a Joint Coordinating Committee will be established whose functions and composition are described in Annex VII.

#### V. JOINT EVALUATION

Evaluation of the Project will be conducted jointly by the two Governments through JICA and the Barbadian authorities concerned during the last six months of the cooperation term in order to examine the level of achievement.

#### VI. CLAIMS AGAINST JAPANESE EXPERTS

The Government of Barbados undertakes to bear claims, if any arises, against the Japanese experts engaged in technical cooperation for the Project resulting from, occurring in the course of, or otherwise connected with the discharge of their official functions in Barbados except for those arising from the willful misconduct or gross negligence of the Japanese experts.

#### VII. MUTUAL CONSULTATION

There will be mutual consultation between the two Governments on any major issues arising from, or in connection with this Attached Document.

#### VIII. MEASURES TO PROMOTE UNDERSTANDING OF AND SUPPORT FOR THE PROJECT

For the purpose of promoting support for the Project among the people of Barbados, the Government of Barbados will take appropriate measures to make the Project widely known to the people of Barbados.

IX. TERM OF COOPERATION

The duration of the technical cooperation for the Project under this Attached Document will be three (3) years from \_\_\_\_\_, 2008

- ANNEX I MASTER PLAN
- ANNEX II LIST OF JAPANESE EXPERTS
- ANNEX III LIST OF MACHINERY AND EQUIPMENT
- ANNEX IV PRIVILEGES, EXEMPTIONS AND BENEFITS FOR JAPANESE EXPERTS
- ANNEX V LIST OF TURKISH COUNTERPART AND ADMINISTRATIVE PERSONNEL
- ANNEX VI LIST OF LAND, BUILDINGS AND FACILITIES
- ANNEX VII JOINT COORDINATING COMMITTEE

## ANNEX I MASTER PLAN

## 1. OBJECTIVES OF THE PROJECT

## (1) Overall Goal

Disaster damages in CDERA Participating States are mitigated through Enhancement of Community Resilience to the flood hazard

## (2) Project Purpose

Capacity of CDERA and five pilot states for managing the flood hazard is increased

## 2. OUTPUTS OF THE PROJECT

- (1) Early Warning Systems for the flood hazard established and implemented at the pilot sites
- (2) Capability of the Regional team to develop flood hazard maps and to establish flood early warning systems upgraded
- (3) Hydrological database is established and functioning at the Caribbean Institute of Meteorology and Hydrology (CIMH)

## 3. ACTIVITIES OF THE PROJECT

- (1.1) Procurement and installation of hydrological and meteorological observation equipment and start of observation at the five (5) pilot sites. (Including telemetry systems for large basins in Guyana and Belize)
- (1.2) Development of GIS database at the five (5) pilot sites
- (1.3) Flood analysis at the five (5) pilot sites
- (1.4) Preparation of flood hazard maps for each of the five (5) pilot sites showing inundation areas, shelters, evacuation routes etc.
- (1.5) Information Collection on the communities at the five (5) pilot sites for preparing CDM plans
- (1.6) Preparation of CDM plans at the five (5) pilot sites
- (1.7) Establishment of flood early warning system at the five (5) pilot sites
- (1.8) Disaster evacuation training at the five (5) pilot sites based on the CDM plan
- (1.9) Implementation of Disaster Imagination Game (DIG) at the pilot sites
- (1.10) Training in Japan of the NTs counterparts about hydrological observation and CDM plan



2

- (2.1) Revision of the manual for flood hazard mapping prepared in Phase1 based on the result of activities at the five (5) pilot sites (Including the establishment of cartographic standards for Flood Hazard Mapping)
- (2.2) Revision of the manual for CDM plan prepared in Phase1 based on the result of activities at the five (5) pilot sites
- (2.3) Preparation of the manual for flood early warning system
- (2.4) Hold workshops and seminars on flood early warning system
- (2.5) Training in Japan of the RT and/or NT counterparts in flood hazard mapping, CDM planning, flood early warning systems and DIG facilitation

3

- (3.1) Evaluation of the status of hydrological data collection and management
- (3.2) Development of a web-based data collection, management and dissemination program
- (3.3) Procurement and installation of the computer equipment, software and peripherals for collection and dissemination of hydrological data at the regional and national levels
- (3.4) Training on input and dissemination of hydrological data at the regional and national levels

4. JAPANESE TECHNICAL COOPERATION

The Government of Japan will assist the Government of Barbados in carrying out the activities for obtaining the outputs, which are described in the paragraph 2 above.

ANNEX II LIST OF JAPANESE EXPERTS

(1) Long-term experts

- (1) Expert on Disaster Information Management and Project Administration

(2) Short-term experts

- (1) Expert on flood analysis
- (2) Expert on flood hazard mapping and flood early warning system
- (3) Expert on community disaster management planning
- (4) Expert on hydrological Database
- (5) Expert on Disaster Imagination Game(DIG)

### ANNEX III LIST OF MACHINERY AND EQUIPMENT

1. Computer Software
  - Hydrological Database
  - Flood Simulation in the Flood Plain
  - GIS
  
2. Observation Equipment
  - Rainfall Recorder
  - Water Level Gauge
  - Telemetry System
  - Warning System

ANNEX IV PRIVILEGES, EXEMPTIONS AND BENEFITS FOR JAPANESE EXPERTS

1. Exemption from income tax and charges of any kind imposed on or in connection with the living allowance remitted from abroad.
2. Exemption from import and export duties and any other charges imposed in respect of personal and household effects which may be brought into Barbados including vehicles imported or locally purchased ex-bond with 6 months of arrival.
3. Free medical and dental services and use of facilities at governmental hospitals and health centers.

ANNEX V LIST OF BARBADIAN COUNTERPART AND ADMINISTRATIVE PERSONNEL

1. Project Director

Coordinator, the Caribbean Disaster Emergency Response Agency (CDERA)

2. Project Manager

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3. Counterpart

Suitably qualified personnel to counterpart each Japanese expert as specified in Annex II.

4. Administrative Personnel in CDERA

Administrative personnel such as Secretaries, Typists, Clerks, Drivers, etc. could be involved in the Project implementation as necessary.

5. Other personnel mutually agreed on as necessary

## ANNEX VI LIST OF LAND, BUILDINGS AND FACILITIES

### 1. Land

Land of the Caribbean Disaster Emergency Response Agency (CDERA)

### 2. Buildings and Facilities

- (1) Sufficient space for the implementation of the Project
- (2) Offices and necessary facilities for the Japanese experts
- (3) Services such as electricity, water supply, sewerage system, telephone, etc., as necessary for the activities under the Project
- (4) Transportation needed for the implementation of the Project
- (5) Other facilities mutually agreed on as necessary

## ANNEX VII JOINT COORDINATING COMMITTEE

## 1. Functions

The Joint Coordinating Committee (hereinafter referred to as the “JCC”) will be set up to promote effective technical cooperation under the Project. The JCC will meet at least once a year, and whenever necessary, in order to fulfill the following functions:

- (1) to review the progress of activities implemented under the annual work plan;
- (2) to review and exchange opinions on major issues that may arise during the implementation of the Project; and
- (3) to discuss any other issue(s) pertinent to the smooth implementation of the Project.

## 2. Composition

The Joint Coordinating Committee to be set up will consist of:

- (1) Chairperson: Project Director (Coordinator of CDERA)
- (2) Members

## Representatives of Member Organizations

- Ministry of Foreign Affairs, Barbados
- University of West Indies (UWI)
- National Disaster Organizations (NDOs)

## Japanese Experts

- Expert on Disaster Information Management and Project Administration
- Expert on flood analysis
- Expert on flood hazard mapping and flood early warning system
- Expert on community disaster management planning
- Expert on hydrological Database

NOTE: Official(s) of the Embassy of Japan in the Republic of Trinidad and Tobago and other personnel concerned to be assigned by JICA, if necessary.

事業事前評価表（技術協力プロジェクト）

<p><b>1. 案件名</b> カリブ災害管理プロジェクトフェーズ 2</p>
<p><b>2. 協力概要</b></p> <p>(1) プロジェクト目標とアウトプットを中心とした概要の記述          本プロジェクトは、カリブ災害緊急対策機関（Caribbean Disaster Emergency Response Agency: 以下 CDERA）およびパイロット 5 カ国（ドミニカ、セントルシア、グレナダ、ガイアナ、ベリーズ）の洪水管理能力の向上を目指すものである。具体的には、各国 1 箇所のパイロットサイトにおいて CDERA 主導の下に洪水ハザードマップ作成、コミュニティ防災計画策定、早期警戒体制構築等の活動を行い、その活動を通じて CDERA および各国の防災関連機関の洪水管理能力の向上を図る。また、域内の水文情報の共有を容易にするため、CDERA の関連機関であるカリブ水文気象学研究所（Caribbean Institute of Meteorology and Hydrology : 以下 CIMH）にウェブベースの水文データベースを構築する。</p> <p>(2) 協力期間          2008 年 7 月から 2011 年 6 月（3 年間）</p> <p>(3) 協力相手先機関          カリブ災害緊急対策機関（CDERA）、パイロット 5 カ国（ドミニカ、セントルシア、グレナダ、ガイアナ、ベリーズ）の防災機関          なお、西インド諸島大学トリニダード・トバゴ校（UWI TT）およびジャマイカ校（UWI Jamaica）がプロジェクト実施に協力する。</p> <p>(4) 受益対象者          直接受益者          CDERA（カリブ災害緊急対策機関）およびその関連機関である CIMH（カリブ水文気象学研究所）の職員          ドミニカ、セントルシア、グレナダ、ガイアナおよびベリーズの防災機関職員          パイロットサイトの住民          間接受益者          CDERA 加盟国の洪水危険地域の住民</p>
<p><b>3. 協力の必要性・位置づけ</b></p>
<p>(1) 現状と問題点          カリブ海の東側に連なる大小アンティル諸島は、大型のハリケーン、洪水をはじめとする災害により大きな被害を受けやすい地域である。カリブ地域は経済規模の小さな国が多いことから、自力でこれらの災害に対処することが難しく、このため同地域の国々は国連の指導のもと、1991 年に CDERA を設立した。当初 CDERA は、災害被害に対する緊急対応の調整機関として設立されたが、現在は緊急対応に加え、事前対応を含んだ総合的な災害管</p>



理を行う機関として活動している。他方、CDERA は人的資源、機材ならびに災害予防に関する技術力不足のため、総合的な災害管理を行う機関としての体制が整っていない。このような状況の下、2000 年の日カリコム閣僚レベル会合では、日本がカリブ地域の防災に関する協力を促進していくことが確認された。この流れを受け、2002-2006 年に技術協力プロジェクト「カリブ地域災害管理プロジェクト（以下フェーズ 1）」が実施された。

フェーズ 1 は、CDERA のハザードマップ作成およびコミュニティ防災計画策定に関する能力向上を目的とし、CDERA を中心とした防災組織体制の確立、パイロット国であるバルバドス、トリニダード・トバゴ、セントビンセントにおける洪水ハザードマップ作成およびコミュニティ防災計画の策定、関連マニュアルの整備等の成果をあげた。

しかしながら、今後さらに被害を軽減していくためには洪水解析および洪水ハザードマップに関する精度の向上およびこれらを活用した洪水早期警戒体制の構築等が必要となること、フェーズ 1 において継続的な水文データ収集の必要性が指摘されたこと、および近年気候変動の影響とも考えられる大型ハリケーンや集中豪雨によりカリブ地域では洪水被害が拡大しており、他の CDERA 加盟国への洪水対策の普及が急務となっていることから、本プロジェクト（フェーズ 2）が要請された。

## (2) カリブ地域防災計画上の位置づけ

カリブ地域では、総合災害管理（CDM）戦略およびカリブ地域コミュニティプログラムフレームワーク（2005-2015）を策定し、次のような優先分野において、防災対策を推進することとしている。

- ハザードマッピングおよび危険度評価
- 洪水管理
- 地域防災計画策定
- 早期警戒体制の確立
- 気候変動対策
- 防災知識の強化

本プロジェクトはこれらの戦略実施に対して大きく寄与するものである。

## (3) 日本の援助政策、JICA 国別事業実施計画上の位置づけ

日本は、カリブ共同体・共同市場（Caribbean Community and Common Market: CARICOM）との間で 1993 年より毎年日カリコム事務レベル協議を開催しており、2000 年 11 月には日カリコム閣僚レベル会合を東京で開催し、「21 世紀における日カリコム協力のための新たな枠組み」を採択した。その中で、日本は自然災害に対処し、予防・復興機構を確立するための適切な資源の整備に対する協力、また、災害予防、緊急対応および災害管理に係る地域機関、国家機関の制度的強化の促進に対する協力を謳っている。また、その後の事務レベル協議においても同方針の継続を確認している。

#### 4. 協力の枠組み

プロジェクト目標「CDERA およびパイロット 5 カ国における洪水管理能力が向上する」を達成するため、以下の活動を行う。

第 1 に、パイロットサイトにおいて水文気象観測機材の設置、洪水解析、洪水ハザードマップ作成、コミュニティ防災計画策定等を通じて、洪水早期警戒体制を確立する。第 2 に、これらのパイロットサイトにおける活動結果をフェーズ 1 で作成したマニュアルに反映し、セミナー・ワークショップにて知見を共有することにより、CDERA およびパイロット 5 カ国の防災関連機関の能力向上を図る。第 3 に、域内の水文情報の共有を容易にするため、CIMH にウェブベースの水文データベースを構築する。

なお、上記活動は CDERA が主体的に行うものとし、JICA 専門家はフェーズ 1 において移転された技術の質的向上を目指しつつ、これを支援する。

##### (1) 協力の目標（アウトカム）

###### ①協力終了時の達成目標（プロジェクト目標）と指標・目標値

<目標>

CDERA およびパイロット 5 カ国における洪水管理能力が向上する

<指標・目標値>

1. CDERA が中心となってパイロット 5 カ国の防災関連機関と協力し、パイロットサイトにおいて洪水ハザードマップおよびコミュニティ防災計画（以下 CDMP）が作成され、洪水早期警戒体制が確立される
2. CDERA およびパイロット 5 カ国の防災関連機関によって、パイロットサイト以外の地域で同様のプロジェクトを実施するためのアクションプランが作成される

###### ②協力終了後に達成が期待される目標（上位目標）と指標・目標値

<目標>

コミュニティにおける洪水対応能力の強化を通じて、CDERA 加盟国における災害被害が軽減される

<指標・目標値>

1. 加盟国における年間の被災者数が減少する
2. 加盟国における年間の被害額が減少する

##### (2) 成果（アウトプット）と活動

成果 1：洪水早期警戒体制がパイロットサイトで確立され、実施される

- 活動：1-1. パイロットサイトにおいて水文気象観測機材を設置し、観測を開始する
- 1-2. パイロットサイトにおいて GIS データベースを整備する
- 1-3. パイロットサイトにおいて洪水解析を行う
- 1-4. パイロットサイトにおいて浸水地域、避難所、避難ルート等を示す洪水ハザ

ードマップを作成する

- 1-5. パイロットサイトにおいて CDMP 作成のためのコミュニティ情報を収集する
- 1-6. パイロットサイトにおいて CDMP を作成する
- 1-7. パイロットサイトにおいて洪水早期警戒体制を確立する
- 1-8. パイロットサイトにおいて CDMP に基づく避難訓練を実施する
- 1-9. パイロットサイトにおいて Disaster Imagination Game (DIG) を実施する
- 1-10. パイロット 5 カ国の防災関連機関職員を対象とし、水文観測および CDMP に関する本邦研修を実施する

(指標・目標値)

1. 全てのパイロットサイトにおいて洪水ハザードマップが作成される
2. 全てのパイロットサイトにおいて CDMP が作成される
3. 全てのパイロットサイトにおいて洪水早期警戒体制が構築される

成果 2 : 洪水ハザードマップ作成および洪水早期警戒に関する CDERA およびパイロット 5 カ国の能力が向上する

- 活動 : 2-1. パイロットサイトにおける活動結果に基づき、フェーズ 1 で作成された洪水ハザードマップマニュアルを改訂する (洪水ハザードマップの作図標準の確立を含む)
- 2-2. パイロットサイトにおける活動結果に基づき、フェーズ 1 で作成された CDMP マニュアルを改訂する
- 2-3. 洪水早期警戒マニュアルを作成する
- 2-4. CDERA、CIMH 等の職員・研究者およびパイロット 5 カ国の防災関連機関職員を対象とし、洪水ハザードマップ、CDMP、洪水早期警戒体制および DIG ファシリテーションに関する本邦研修を実施する
- 2-5. 洪水早期警戒体制に関するワークショップおよびセミナーを開催する
- 2-6. パイロットサイトでの活動結果に基づき、他の地域への普及を図るためのアクションプランを作成する

(指標・目標値)

1. パイロットサイトでの活動結果を反映して、洪水ハザードマップマニュアルが改訂される
2. パイロットサイトでの活動結果を反映して CDMP マニュアルが改訂される
3. 洪水早期警戒体制構築マニュアルが作成され、全ての関係機関に配布される
4. ハザードマップおよびコミュニティ防災計画を活用した洪水早期警戒体制構築に関するワークショップが年 2 回以上実施される

成果 3 : CIMH に水文データベースが構築され、利用される

活動 : 3-1. 水文データの収集・管理状況を評価する。

- 3-2. ウェブベースの水文データ収集・管理・共有プログラムを開発する。
- 3-3. 地域、国レベルにおいて、水文データの収集・管理・共有のためのコンピュータ、ソフトウェアおよび周辺機器を設置する。
- 3-4. 地域、国レベルにおいて、水文データの入力・共有に関する研修を実施する。

(指標・目標値)

- 1. CDERA 加盟国の防災関連機関からの上記プログラムを通じた定期的な水文データ提供がある
- 2. CDERA 加盟国の防災関連機関からの上記プログラムを通じた定期的な水文データベースへのアクセスがある

(3) 投入 (インプット)

① 日本側

1) 下記分野の専門家派遣

- ・ 災害情報分析
- ・ 洪水解析
- ・ 洪水ハザードマップ／早期警戒体制構築
- ・ コミュニティ防災計画
- ・ 水文データベース
- ・ DIG

2) 機材供与

観測機器、データベース関連機器等

3) カウンターパート研修

年間数名程度

② CDERA 側

- 1) カウンターパートの配置
- 2) 執務環境 (執務室、設備) の整備
- 3) プロジェクト運営管理費の確保

(4) 外部要因 (満たされるべき外部条件)

① 前提条件

- 1) カウンターパートが当初予定通り配置される。
- 2) プロジェクト予算が当初予定通り確保される。

② 成果達成のための外部条件

- 1) 技術移転を受けたカウンターパートが現在の職場に留まる。

③ プロジェクト目標達成のための外部条件

- 1) カリブ共同体の防災政策に大幅な変更がない。

<p>2) CDERA および各国防災機関に対して予算・人員が適切に配分される。</p> <p>3) 急激な自然環境変化が発生しない。</p> <p>④ 上位目標達成のための外部条件</p> <p>1) 包括的災害管理戦略（CDM）が実行される。</p>
<p><b>5. 評価 5 項目による評価結果</b></p>
<p>(1) 妥当性</p> <p>本プロジェクトは以下の点から妥当性が高いと判断できる。</p> <ul style="list-style-type: none"> <li>● CDERA は総合防災戦略の一環としてカリブ地域コミュニティプログラムフレームワーク（2005-2015）を策定し、防災能力の向上を目指している。本プロジェクトもこのフレームワークに沿った形で要請されており、カリブ地域の総合防災戦略と合致する。また、防災に関する他ドナーの支援もこの枠組みの中で整理されているため、各ドナーの役割分担は明確である。</li> <li>● また、我が国は 2000 年 11 月に策定された「21 世紀における日カリコム協力のための新たな枠組み」の中で、予防・復興機構を確立するための適切な資源の整備に対する協力、また、災害管理に係る地域機関、国家機関の制度的強化の促進に対する協力の推進を謳っており、本プロジェクトの協力内容と合致する。</li> <li>● JICA は 2002-2006 年の 5 年に亘り、フェーズ 1 を実施するとともに、防災フレームワーク作成を支援した。本プロジェクトはフェーズ 1 で移転した技術をより精度の高い洪水解析や早期警戒体制構築によりさらに向上させ、その効果的な活用を図るとともに、新たに 5 カ国でパイロットプロジェクトを行うことにより地域内への普及に貢献するものであり、協力の妥当性は高い。</li> </ul> <p>(2) 有効性</p> <p>本プロジェクトは、以下の理由から有効性があると予測される。</p> <ul style="list-style-type: none"> <li>● 洪水管理能力の向上のためには、洪水解析による精度の高いハザードマップ作成や早期警戒体制の構築が有効であり、それらを成果とすることで、目標達成の確度は高い。</li> <li>● フェーズ 1 の経験から、CDERA、CIMH 等の職員・研究者は我が国の当分野における技術協力の仕組み、技術移転の方法を理解しており、パイロット 5 カ国の防災関連機関の職員を指導する能力を有している。</li> <li>● 外部条件である「CDERA および各国防災機関に対して予算・人員が適切に配分される」は、フェーズ 1 での実績から見て満たされる可能性は高い。</li> </ul> <p>(3) 効率性</p> <p>本プロジェクトの効率性は、以下の理由から高いと見込まれる。</p> <ul style="list-style-type: none"> <li>● フェーズ 1 で移転された基本的な技術が CDERA、CIMH 等の職員・研究者に根付いてい</li> </ul>

るため、短期の専門家派遣でもレベルの高い技術を移転することが可能である。例えば洪水ハザードマップについては、フェーズ 1 で移転した浸水想定に関する技術に加えて、国ごと、場所ごとの特性を加味した洪水解析を行うことにより、より一層の精度向上が図れる。

- フェーズ 1 で供与された機材を活用して、ハザードマップ作成等を行うため、費用対効果は高い。
- フェーズ 1 の経験者の多くは CDERA、CIMH 等に留まっており、今後も高い定着率が期待できる。

#### (4) インパクト

本プロジェクトのインパクトは以下のように予測できる。

- 上位目標である「コミュニティにおける洪水対応能力の強化を通じて、CDERA 加盟国における災害被害が軽減される。」に関しては、CDERA、CIMH 等の職員・研究者の能力が高く、職員の定着率も高いことから、プロジェクト終了後に CDERA のイニシアチブの下に達成されることが見込まれる。
- 本件において CIMH に水文データベースの構築が実現し、共有化が進むことで、CDERA、CIMH および各国防災関連機関の情報共有が進み、連携が促進される。

#### (5) 自立発展性

以下の観点から、自立発展性は確保されると期待できる。

- 本プロジェクトでは、パイロットサイトにおける CDERA、CIMH 等の職員・研究者およびパイロット 5 カ国の防災関連機関職員の主体的な活動を通じて能力向上を図るため、プロジェクト終了後も彼らによる活動の継続と他地域への普及が期待できる。
- フェーズ 1 の成果が有効であったことから、CDERA やパイロット国では、適切な人員・予算が配分されており、本プロジェクト終了後にも同様に人員・予算が配分され、洪水被害を受けているパイロットサイト以外の国・地域へと普及していく可能性は高い。
- ただし、CDERA の予算はそのほとんどをドナーからの資金援助に頼っている。今後においても他ドナーの資金援助が継続することが条件となるものの、その可能性は高い。

#### 6. 貧困・ジェンダー・環境等への配慮

途上国では河川周辺の低地など、洪水被害を受ける可能性が高い地域に貧困層が居住するケースが多い。また、社会情報から孤立する障害者、高齢者や女性も、警報などに接する機会を逸する等、災害弱者として被害にあう可能性は高い。プロジェクト実施に当たっては、このような社会的弱者の意見を取り入れつつ、彼らに対する防災教育・普及活動や避難訓練への参加促進、誰もが利用できるハザードマップの作成、誰もが接することのできる警報や情報伝達など、社会的弱者に十分配慮した活動を行う。

**7. 過去の類似案件からの教訓の活用**

カリブ地域災害管理プロジェクト（フェーズ1）（2002年-2006年） 協力総額 4.3 億円

- 本案件では、機材供与のタイミングが遅れたことにより、プロジェクトがやや遅滞した。これは、受入国側の通関手続き（免税措置）等が遅れたことに起因する。フェーズ2においては、事前に十分な手続き上の準備を行い、こうした事態の発生を防止する。

**8. 今後の評価計画**

- 終了時評価 2010年12月頃
- 事後評価 協力終了3年後を目途に実施予定