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カリブ災害管理プロジェクトフェーズ２実施協議調査
報告資料（2008年８月５日～15日）

１．調査背景

2002～2006 年に実施された「カリブ災害管理プロジェクト」では、カリブ災害緊急対策機関 CDERA を主なカウンターパートとし、CDERA を中心とした組織体制の確立、洪水ハザードマップ作成体制の確立・強化、加盟国における地域防災計画策定能力の向上等の活動を行った。その結果、成果は概ね達成されたものの、パイロットサイトが 3 カ国に限られていたこと、今後さらに被害を軽減していくためには洪水早期警戒体制構築のための技術移転が必要となることから、2008 年 12 月より 3 年間、本プロジェクトを実施する予定である。

本プロジェクトでは新規対象５カ国においてパイロットプロジェクトを実施する。その中で、より精度の高い洪水ハザードマップ作成、コミュニティ防災計画の作成、および洪水早期警戒体制の構築等の活動を行う。

本実施協議調査はその情報収集および関係機関との合意形成（R/D 署名交換）を目的として実施する。

２．団員構成

(1)総括　　大井　英臣　JICA 地球環境部国際協力専門員
(2)協力企画　宇多川　祐樹　JICA 地球環境部水資源防災グループ防災一課

３．調査日程

別添参照

４．調査結果

(1)CDERA との協議(8 月 7 日)

- Mr. Collymore (Coordinator, CDERA)にプロジェクト内容および RD に関する説明・協議を行い、概ね合意を得た。

(2)ガイアナ国防災機関（Civil Defense Commission）との協議（8 月 8 日）

- Dr. Luncheon(Head of Presidential Secretariat)および Mr. Atherly(Major General, CDC)にプロジェクト内容および RD に関す

る説明・協議を行った。また、R/D の署名交換を行った。

(3)ガイアナ大学教授との協議（8 月 8 日）

- Ms. Bynoe (Director, Uni. of Guyana)と協議を行い、コミュニティ防災分野カウンターパートとして本プロジェクトに貢献してもらいたい旨を説明し、概ね前向きな回答を得た。

(4)パイロットプロジェクト候補地の視察

- CDC よりパイロットプロジェクト候補地として挙げられた海岸地域の現地踏査を行った。

(5)バルバドス国外務省および CDERA との R/D 署名交換(8 月 11 日)

- Mr.Chandler(permanent secretary, MOF, BARBADOS)および Mr. Collymore と R/D の署名交換を行った。

(6) カリブ水文気象学研究所（CIMH）との協議

- Mr. Farrell (Principal, CIMH) にプロジェクト内容に関する説明を行うとともに、CIMH および関連プロジェクトに関する情報収集を行った。また、本プロジェクトに対する協力を依頼した。

(7) 西インド諸島大学（UWI TT）との協議

- Dr.Opadeyi(Senior lecturer and coordinator)にプロジェクト概要を説明。フェーズ２における協力を依頼した。

(8)トリニダードトバゴ国公共事業省との協議

- 同国で試験的に実施している古タイヤを使用した護岸工の現状等について情報収集を行った。

(9)在ポートオブスペイン日本大使館への報告

- 関大使に本調査の成果を報告し、本年 12 月に開始するプロジェクトに対する協力を改めて要請した。関大使からは本プロジェクトに対する期待と、プロジェクト終了後の継続性を重視して欲しい旨コメントがあった。

３．その他の対象国ＲＤ署名について

パイロットプロジェクト対象国 5 カ国のうち、本調査で署名が完了したガイアナ以外の 4 カ国（ベリーズ、ドミニカ、セントルシア、グレナダ）については、各駐在員事務所およびカリコム中居専門家が 8 月末を目途に署名を取り付け、地球環境部へ送付する。

別添
実施協議調査日程

Shedule of CADM2 Implementation Study

No.	Date		Activity	Accommodation
1	8/5	Tue	Tokyo 12:00⇒CHICAGO 9：30(JL010)	Bridgetown
2	8/6	Wed	CHICAGO 11:05⇒MIA 15:08(JA5452) MIA 16:45⇒Bridgetown 20:20(AA1641) Internal Meeting	Bridgetown
3	8/7	Thu	7:30 Meeting with CDERA Bridgetown 11:30⇒Georgetown 13:30(LI521)	Georgetown
4	8/8	Fri	Meeting with Civil Defense Commission Site Visit Meeting with Ms. Bynoe (Uni. of Guyana)	Georgetown
5	8/9	Sat	Georgetown9:55⇒Bridgetown11:55(LI778)	Bridgetown
6	8/10	Sun	Site Visit	Bridgetown
7	8/11	Mon	11:00 Meeting with CDERA (R/Dsigning) 13:30 Meeting with CIMH	Bridgetown
8	8/12	Tue	Site Visit Bridgetown19：35⇒Port of Spain20：30(BW415)	Port of spain
9	8/13	Wed	9:00 Meeting with UWI T&T (Dr.Jacob Opadeyi) 11:00 Meeting with Drainage Division of Ministry of Public Works (Ms. Candice Gray) 14:00 Reoprt to Japanese Embassy	flight
10	8/14	Thu	Port of Spain 1:05 ⇒New York 6:15(BW520) New York 13:30⇒	flight
11	8/15	Fri	Narita 16:25(JL005)	

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No. IR/2006/191

The Ministry of Foreign Affairs and Foreign Trade of Barbados presents its compliments to the Embassy of Japan and with reference to the Ministry's Note No. IR/2006/75 of March 29, 2006, has the honour to submit at the request of CDERA, the revised version of the Expansion of the Caribbean Disaster Management (CADM) Project as was discussed by CDERA and JICA officials in August 2006.

The Ministry has further the honour to inform that at the said meeting, it was agreed that the attached document should reach the Embassy of Japan by August 31, 2006 for onward transmission to the Japan International Cooperation Agency (JICA) to allow for the inclusion in the next financial year.

The Ministry of Foreign Affairs and Foreign Trade of Barbados avails itself of this opportunity to renew to the Embassy of Japan the assurances of its highest consideration.

Ministry of Foreign Affairs and Foreign Trade
Barbados

August 30, 2006

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Our Reference: CADM/1334/06

August 30, 2006

Permanent Secretary
Ministry of Foreign Affairs and Foreign Trade
Culloden Road
St Michael

Attention: Japan Desk Officer

Expansion of the Caribbean Disaster Management (CADM) Project

Dear Sir/Madam

Please see attached proposal for expansion of the Caribbean Disaster Management Project.

After consultation with Messrs Suguru Nakane, Central America and the Caribbean Representative, regional Department III and Tadaomi Nakai, JICA Project Identification Expert, Resource Mobilisation and International Cooperation CARICOM Secretariat, we have developed a set of initiatives to expand the Caribbean Disaster Management (CADM) Project within the context of the Comprehensive Disaster Management Strategy and the Hyogo Framework 2004.

It is the desire of CARICOM/Japan Technical Cooperation that the document reach the Embassy of Japan by August 31, 2006 to allow the opportunity for inclusion in the next financial year.

In this regard, we will be happy if you can facilitate the early dispatch of this document to the Japan International Cooperation Agency (JICA) through the Embassy of Japan in Trinidad and Tobago.

Regards

Yours truly

Jeremy Collymore
Coordinator

Encs.

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APPLICATION FORM FOR JAPAN'S TECHNICAL COOPERATION

1. Date of Entry:	August 29, 2006
2. Applicant:	The Government of Barbados (on behalf of Caribbean Disaster Emergency Response Agency and CARICOM)
3. Project Title	Expansion of Caribbean Disaster Management Project Enhancing Flood Hazard Mapping and Community-based Disaster Planning in CDERA Participating States
4. Implementing Agency:	Caribbean Disaster Emergency Response Agency (CDERA)
Address:	Building #1, Manor Lodge, Lodge Hill, St. Michael
Contact Person:	Jeremy Collymore, Coordinator
Tel. No: Fax. No: E-Mail:	1 246 425 9386 1 246 425 8854 coordinationcc@cdera.org
Government Focal Point	Ministry of Foreign Affairs and Foreign Trade
Address:	1 Culloden Road, St. Michael
Contact Person:	Mr. Samuel Chandler
Tel. No: Fax. No:	1 246 431 2200 1 246 429 6652

5. Background of the Project

The Caribbean Disaster Management (CADM) Project is being implemented under the CARICOM/Japan Technical Cooperation Agreement through the Caribbean Disaster Emergency Response Agency (CDERA) with the support of the Japan International Cooperation Agency. The project was initiated in August 2002 and projected to end on July 31, 2005 but was extended to March 31, 2006.

The project has sought to mitigate damages in CDERA Participating States particularly for the flood hazard. The emphasis of the project on this hazard, is in keeping with the findings of the **Status of Disaster Preparedness in CDERA Participating States** conducted in May 2001 which identified floods as the most common event – occurring in 90 % of CDERA Participating States in the last five years, however in contrast only 25% of these countries have any plans in place to guide disaster management activities for this hazard.

Flood Hazard Mapping and Community Disaster Management (DM) Planning incorporating the result of the mapping are the important and initial steps to achieve the goal. However, in view of the rather high technology and costly equipment required for flood hazard mapping, it is difficult for each Participating State to possess this technology and equipment. In an effort to transfer this technology in the most practical and effective way therefore, a team of qualified experts and appropriate equipment have been assigned to CDERA (Regional Team) to prepare flood hazard maps and community disaster management plans in cooperation with a group of stakeholders to be established in each member state (National Team), each time flood hazard mapping is proposed.

The Project was piloted in Barbados, St. Vincent and the Grenadines and Trinidad and Tobago through the establishment of a Regional Team comprised of personnel primarily from the Caribbean Disaster Emergency Response Agency, University of the West Indies and the Caribbean Institute of Meteorology

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and Hydrology, who collaborated with National Teams established in these countries. The Terminal Evaluation signed on March 17, 2004 found this to be an effective collaborative arrangement for flood hazard mapping and community disaster management planning that can be applied to other Participating States in the future.

The Caribbean Disaster Management Project has made a significant contribution to the implementation of the Comprehensive Disaster Management Strategy - the blueprint for disaster management in the Caribbean region - which aims to achieve sustainable development in the Caribbean. In fact the project makes a direct contribution to the five Intermediate Results (IRs) of the Strategy. These are: Institutional Capacity Building, Teaching Research and Education, Promotion of CDM in regional institutions, Preparedness Mitigation and Response and Use of Hazard information for decision making.

The project has also benefited the region in specific ways namely:

- Establishing a framework for standardization of methodologies for Flood Hazard Mapping and Community Disaster Planning in the Caribbean region and building capacities through technology transfer, knowledge enhancement and equipment.

- Facilitating the establishment of a firm foundation for building of institutional partnerships for the implementation of disaster management in the Caribbean region. The establishment of a Regional Team utilizing expertise from several regional institutions for undertaking Flood Hazard Mapping and Community Disaster Planning has not only strengthened the networking between CDERA and other regional institutions but has also introduced other potential competent partners at the national and regional level with whom important strategic alliances can be developed. A number of diploma programmes, short courses, graduate programmes and researches in UWI and CIMH have resulted from the project implementation.

- Providing a pioneering approach for the Caribbean region by utilizing the blend of science and technology to alleviate human suffering.

- Equipping CDERA with the tools and methodological approach to address the most commonly occurring hazard in its Participating States. Flooding in the region has been a silent developmental killer, necessitating urgent attention, given its recurrence and impact.

This proposed Extension of the CADM Project is being undertaken in the context of the Hyogo Framework 2004 under three of the five thematic areas. It supports the outcomes of the The Caribbean Community Regional Programme Framework 2004 which was produced by CDERA for the World Conference on Disaster Reduction (WCDR) with the support of the Japan International Cooperation Agency (JICA) to articulate the region's disaster management priority areas for action within the context of the Comprehensive Disaster Management (CDM) Strategy.

This Framework identifies the priority areas for the region 2001-2015 as follows:

- Hazard Mapping And Vulnerability Assessment,
- Flood Management,
- Community Disaster Planning,
- Early Warning Systems,
- Climate Change, and
- Knowledge Enhancement.

This project directly responds to five of these priority areas and in doing so will accelerate the implementation of CDM in the region and the Hyogo Framework in the Caribbean.

The project is also being proposed against the background of the New Framework for Japan-CARICOM Cooperation for The Twenty-First Century, 2000 which seeks to promote cooperation for the provision of

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adequate resources to cope with natural disasters and to establish machinery for preventative action and rehabilitation. It also encourages international cooperation to be promoted to strengthen the institutional capacity of the regional and national agencies concerned with disaster prevention, emergency response and management.

Socio-economic Conditions of the Project Area

This project is a technical cooperation project implemented with CDERA, which is responsible for comprehensive disaster management in the Caribbean. In the following descriptions, the words "the Caribbean" and "the CDERA member states" refer to the 16 CDERA member states.

Table 1 gives an outline of the CDERA member states.

The total land area of the CDERA member states is 272,077 km^2, of which 271,290 km^2 is the total for the 12 independent states. However, the land areas of Guyana in South America (215,000 km^2) and Belize in Central America (22,960 km^2) occupy nearly 90% of this total. Excepting these two countries, the total land area of the 14 island states is 34,100 km^2, with an average of 2,400 km^2. The smallest state, Anguilla, covers an area of only 90 km^2, and the largest island state, The Bahamas, is made up small islands that total an area of 13,880 km^2.

Most of the CDERA member states are small island states.

Table 1 Outline of CDERA Member States, 2005

Country	Land Area (km^2)	Population in 2004	Population Density (pr/km^2)	GDP in 2005 (US$ m.)	GDP per Capita (US$)	Remarks
Anguilla	102	13,254	130	112.0	7,500	
Antigua & Barbuda	440	80,000	182	750.0	11,000	GDP, 2002
The Bahamas	13,880	320,100	23	5,665.0	18,800	
Barbados	430	271,860	632	4,831.0	17,300	
Belize	22,960	282,600	12	1,778.0	6,800	
British Virgin Islands	151	22,643	148	2,498.0	38,900	
Dominica	750	71,468	95	384.0	4,500	
Grenada	340	105,700	311	440.0	5,000	
Guyana	215,000	772,100	4	717.5	787.5	
Jamaica	10,990	2,700,000	246	11,690.0	4,300	
Montserrat	102	9,341	92	29.6	3,400	GDP, 2002
St. Kitts & Nevis	360	46,985	131	339	8,800	
St. Lucia	620	163,700	264	866	5,400	
St Vincent/the Grenadines	390	108,300	278	342.0	2,900	
Trinidad & Tobago	5,130	1,300,000	253	13,790.0	12,700	
Turks & Caicos Islands	430	20,556	48	216.0	11,500	GDP, 2002
Member States Total	272,077	6,288,539	23	43,487.5	8,949	Population, Density and GDP are calculated as averages
Independent 12 States Total	271,290	6,139,200	23	40,832.5	8,274	
14 Island States Total	34,100	5,075,300	149	38,137	10,829	

Source: The World Fact book 2005, Central Intelligence Agency, US

The total population of the region in 2005 was 6.3 million, with a national average of about 390 thousand. The countries with a population of more than 1 million are Jamaica (estimated at 2.7 million in 2005) and Trinidad & Tobago (estimated at 1.3 million in 2005). Anguilla has the smallest population of 13,254. The regional average population density is 23 persons per square kilometer. However, the average density of the island states is 153 persons per square kilometer, excluding Guyana (4 persons per square kilometer) and Belize(12 persons per square

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kilometer). This density is about half of Japan's 336 persons per square kilometer. Conversely, the regions' highest population density of 632 persons per square kilometer (Barbados) is nearly two times that of Japan. It is therefore understood that these island states have comparatively high population densities with the exception of The Bahamas and Turks & Caicos Islands.

The size of the regional economy was estimated at about 43.5 billion US dollars in 2005, with a GDP per capita of about 9,949 US dollars. GDP per capita at the national level varies greatly from the 290 US dollars of Guyana to the 18,800 US dollars of The Bahamas. The economy of this region depends largely on export of agricultural products (bananas, coconuts, citrus fruits and so on) and sugar, and on tourism. Exceptions are Jamaica's export of bauxite/alumina and Trinidad & Tobago's export of crude oil/petrochemicals. Comparatively speaking, Jamaica and Trinidad & Tobago are industrialized powers in the region, but they are also troubled by the existence of a poor class that keeps them at the lower to middle level of GDP per capita. The Bahamas and British Virgin Islands, with GDPs per capita of more than 15,000 US dollars, are mainly engaged in tourism and financial activities. Other countries blessed with natural resources attract many tourists from European and American countries.

However, these economic bases are put in danger by recurred natural disasters such as hurricanes and their associated strong winds and storm surges, floods, and landslides, as well as volcanic eruptions and earthquakes. In addition to these traditional hazards, recent rises in the sea level brought about by global climate change have occurred. In an increasingly competitive global marketplace, with new technologies and rapid changes in the economic environment, the region must make efforts to reduce risks to the investment and infrastructure (such as harbors, airports, power plants, etc.) upon which it depends. If it does not make these efforts, it will be left behind. Due to their small sizes, the Caribbean countries are especially vulnerable to the impact of natural hazards. A single event can destroy a large part of a country's entire economic base and have a direct impact on every one of its people.

Disaster Experiences in the Caribbean

Due to the conditions of location, the Project Area is vulnerable to a variety of natural hazards. Most of the countries are within the hurricane belt. There is also seismic activity throughout the Caribbean related to movement of the Caribbean Plate, and a number of Eastern Caribbean Islands are basically on the tops of volcanoes.

Large-scale hurricanes and associated strong wind, heavy rain and storm surges have repeatedly caused great losses and damage to the countries along their routes. Once, a volcanic eruption nearly destroyed all of a country's economic and social foundation. Flooding has repeatedly occurred in countries like Jamaica and Trinidad& Tobago, and it continues to kill or otherwise affect people and damage physical infrastructure. And droughts have reduced agricultural output and water supply in such countries as Jamaica and Guyana.

In 1979, for example, a variety of large-scale natural disasters occurred. Hurricanes David and Frederick struck Anguilla and Dominica, killing 40 persons, affecting 72,100 persons, and causing 44.65 million dollars worth of damage to Dominica. An eruption of Mt. Soufriere on St. Vincent killed 2 persons and affected 20,000 persons. A flood in Belize affected 17,000 persons. Two floods in Jamaica killed 44 persons, affected 250,000 persons and caused losses worth 64 million dollars. In the following year of 1980, Hurricane Allen struck Barbados, Grenada, Jamaica, St. Lucia and St. Vincent & the Grenadines. This hurricane killed 15 people, affected 135,600, and caused 175.69 million dollars in damage.

Large-scale natural disasters that have occurred since 1981 are as follows:

- 1986—A flood in Jamaica (54 killed, 40,000 affected, and 76 million dollars in damage)
- 1987—A flood in Jamaica (9 killed, 26,000 affected, and 31 million dollars in damage)
- 1988—Hurricane Gilbert (94 killed, 810,000 affected, and 2 billion dollars in damage in Jamaica and St. Lucia put together)
- 1989—Hurricane Hugo (14 killed, 32,000 affected, and 521 million dollars in damage in Antigua & Barbuda, Dominica, Montserrat, St. Kitts & Nevis and the British Virgin Islands put together)
- 1991—A flood in Jamaica (551,300 affected, 35 million dollars in damage)
- 1992—Hurricane Andrew (4 killed, 1,700 affected, and 250 million dollars in damage in The Bahamas)
- 1995—Hurricane Luis and Marilyn (3 killed, 73,500 affected, and 210.93 million dollars in damage in Antigua

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& Barbuda, Dominica, St. Kitts & Nevis and the British Virgin Islands put together)

- 1995—Eruption of Mt. Soufriere in Montserrat (About 8,000 residents evacuated to other countries such as Antigua & Barbuda; the national economy wiped out)
- 1998—Drought in Guyana (720,000 affected and 29 million dollars in damage)
- 1999—Hurricane Lenny (6,000 affected and 46.95 million dollars in damage in Anguilla, Antigua & Barbuda, Dominica, Grenada, St. Kitts & Nevis, St. Lucia and St. Vincent & the Grenadines put together)
- 2000—Hurricane Keith (24 killed, 82,600 affected, and 265.53 million dollars in damage in Belize)
- 2001—Hurricane Michelle (1 killed, 200 homeless and over 2 billion dollars in damage in Jamaica)
- 2002—Hurricane Lili (4 killed and 1500 affected in Jamaica and 2000 homeless in Barbados)
- 2004—Hurricane Ivan (34 killed, 410 000 affected and over 1.5 billion dollars damage in Jamaica and Grenada put together)
- 2005—Hurricane Wilma (1 killed and 1800 affected in Jamaica and the Bahamas put together)

Table 2 shows the main natural disasters that occurred during the period of 5 years from 2000 to 2005. ("Disasters" are defined as those that overwhelm local capacity, necessitating requests for national or international assistance.) 34 events occurred in all, of which 28 were storms such as hurricanes and tropical storms, and 2 were floods. The numbers for the other types of disaster are small, however some country-specific disasters should be observed, for example the droughts in Jamaica and Guyana. In reality, many floods and landslides have coincided with heavy rains that are in addition to the disasters shown below.

Table 2 Disaster Experiences of CDERA Member States by Disaster Type, 2000-2005

Country	Hurricane/ trop. storm	Flood	Landslide	Volcano	Earthquake	Drought	Cold wave	Total
Anguilla								--
Antigua & Barbuda								--
The Bahamas	4							4
Barbados	2							2
Belize	4							4
British Virgin Islands								--
Dominica	1				1			2
Grenada	2							2
Guyana		1	1					2
Jamaica	8	1				1		10
Montserrat								--
St. Kitts & Nevis								--
St. Lucia	1							1
St.Vincent/the Grenadines	3							3
Trinidad & Tobago	2		1					3
Turks & Caicos Islands	1							1
Member States Total:	28	2	2	--	1	1	--	34

Note: "Disasters" are defined as those that overwhelm local capacity, necessitating requests for national or international assistance

Source: The OFDA/CRED International Disaster Database 1900-2005, updated in October, 2005 by the Center for Research on the Epidemiology of Disaster

As shown in Table 3, during the 5-year period from 2000 to 2005, 173 persons were killed and 822,110 persons were affected by disasters. This means that approximately 1.9% of the regional population, 6.3 million in 2005, was affected if duplication is allowed. In many cases the amount of damage was not recorded. For example, damage caused by floods and landslides that occurred in Trinidad in November 2000 was neither recorded in number of instances nor monetary amount. However, the accumulated amount of recorded instances of damage alone has reached 5 billion dollars at 2000 prices, which equals to 20% of the total GDP of the region. It has been observed that in some cases involving small countries, damage from disasters has destroyed the entire national economy. Additionally, single countries have shown conspicuous damage in one particular year. An example is Hurricane Ivan in Grenada where damages were calculated to exceed 200% of the GDP.

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Table 1 Natural Disaster Damage in CDMRA Member States, 2000-2005

Country	Number of Disasters	People Killed	People Affected	Economic Losses (2005, $ m)	Affected people as % of 2005 Population	Economic Losses as % of 2005 GDP
Anguilla	0	—	—	—	—	—
Antigua & Barbuda	0	—	—	—	—	—
The Bahamas	4	5	10,500	250.0	30.4	4.4
Barbados	2	1	3,000	N/A	1.1	—
Belize	4	44	82,000	127.5	32.0	18.4
British Virgin Islands	0	—	—	—	—	—
Dominica	2	3	275	N/A	0.38	—
Grenada	2	40	60,835	889.0	57.8	202
Guyana	2	44	274,774	0.465	35.6	0.06
Jamaica	10	36	387,096	1,237.2	14.3	27.7
Montserrat	0	—	—	—	—	—
St. Kitts & Nevis	0	—	—	—	—	—
St. Lucia	1	0	—	—	—	—
St. Vincent/the Grenadines	3	0	1,530	N/A	1.41	—
Trinidad & Tobago	3	3	1,960	N/A	0.15	—
Turks & Caicos Islands	1	0	200	N/A	0.97	—
Member States Total	54	173	822,170	4,704.205		

Source: Disaster data are from the OFDA/CRED International Disaster Database 1900-2005, and percentages are calculated based on population and GDP shown in Table 2.1.1.

Government's Development Policy for the sector:

The project will be implemented within the context of the Comprehensive Disaster Management (CDM) Strategy and the Caribbean Community Programme Framework 2005-2015 developed in the context of the Hyogo Framework 2005.

Problems to be addressed:

Hydrological Observation and Flood Analysis

Flood Hazard Mapping (FHM) utilizes three tools for map development: Hydrological Observation, Flood Analysis and Geographic Information Systems. In many CDMRA Participating States there is a paucity of rainfall and stream flow data to undertake flood analysis. Relevant, accurate, consistent and complete data sets are required as an input to flood analysis. The Caribbean Institute of Meteorology and Hydrology (CIMH) collects data on an ad hoc basis from many countries but this needs to be strengthened to ensure that there is a reliable repository for this data so that it can be available for Flood hazard mapping in the region.

Geographic Information Systems

Adequate databases for production of flood hazard maps continue to be challenge for the Caribbean region. In the meantime, critical information required for communities, planning and decision making is largely absent. To address this challenge a pilot produce Medium-scale flood hazard model to be used was developed by the CADM Regional Team as a result of the CADM project. These maps identify the likely regions to be flooded for extreme rainfall and they give a mean depth of floodwaters within each region and is a stepping stone in expanding the Flood Hazard Mapping technology. In addition there is a need for certified personnel to expand the Regional Team to effectively manage implementation in 6 countries. It must be noted that Flood Hazard Mapping (FHM) is still an emerging technology for the Caribbean region and there is a need to standardize the cartographic standards for easy interpretation of the information by all users. This can also be quite useful as a guide to the process other Small Islands Developing regions

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Community-based Disaster Management Planning
Risk and vulnerability reduction cannot be successful without involvement at the "grass roots" level. Prepared communities lead to better-prepared countries. The Disaster Imagination Game (DIG) has proven to be a useful exercise in the Caribbean region having achieved good success in Japan. The desire to expand this in the region is driven by its utility for "grassroots" engagement.

Early Warning Systems
Hazard Mapping and Community-based Disaster Management Planning can be undermined if there is an inability to effectively warn the community. Pilot countries have consistently raised the need for a local warning mechanism to activate the community on the threat of a flood. A system developed and used in Latin America is currently being tested by the University of the West Indies for use in CADM pilot states.

6. Outline of the project

6.1 Overall Goal
Disaster damage in CDERA Participating States, particularly the damage related to floods is mitigated.

6.2 Project Purpose
Flood Hazard maps and community-based disaster management plans are prepared for CDERA Participating States utilizing the mechanism, processes and products established under the CADM Project.

6.3 Outputs
1.0 Hydrological observation and flood analysis technology in CDERA Participating States reviewed, strengthened and expanded.
2.0 Geographic Information Systems capability for Flood Hazard Mapping (FHM) in CDERA Participating States strengthened and expanded.
3.0 Community-based Disaster Management Planning (CBDM) capacity for the flood hazard in CDERA Participating States enhanced and broadened.
4.0 An Early Warning System mechanism for the flood hazard is established.

6.4 Project Activities
The project activities herein will expand the CADM initiative fully to six CDERA Participating States and establish the groundwork for expanding the project to the other seven CDERA Participating States.

1.1 Hydrological monitoring stations established in six (6) CDERA Participating States
i. Procure and install hydrological monitoring equipment for six (6) CDERA Participating States
ii. Purchase and install telemetry systems for large basins in Guyana, Belize, Haiti and Suriname
iii. Conduct hydrological observation training for National Team Members at each pilot site
iv. Dispatch Japanese Short Term expert in hydrological observation
1.2 Hydrological database established at CIMH
i. Conduct a study to evaluate the status of hydrological data collection and data management in CDERA Participating States and create hydrological data book
ii. Develop a web-based data collection, data management and data dissemination programme for CDERA Participating States
iii. Procure and install computer equipment, software and peripherals for collection and dissemination of hydrological data at the regional and national levels
iv. Conduct training in hydrological data entry and dissemination at the regional and national levels
v. Establish MOUs with focal point organizations in CDERA Participating States for the sharing of hydrological data
2.1 GIS capability of Regional Team enhanced and expanded
i. Design certified short course on GIS-based Flood Hazard Mapping
ii. Conduct training for five (5) persons to build expertise and provide counterparts for ST
iii. Assign five (5) new persons to Regional Team and utilize for new pilot sites
iv. Convene four consultations with target state
v. Prepare flood hazard maps for three new pilot sites

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2.2 Medium-scale national-wide flood hazard maps established
- i. Undertake in-country meeting with stakeholders and data collection
- ii. Prepare data and undertake digitization
- iii. Create CN, Rainfall and Slope Factor Layers
- iv. Create Flood Hazard Map
- v. Conduct in-country verification of flood hazard map
- vi. Modify and print maps

2.3 Cartographic standards for Flood Hazard Mapping in the Caribbean established
- i. Review cartographic standards for flood hazard mapping globally
- ii. Recommend cartographic standards for flood hazard mapping in the Caribbean
- iii. Convene a cartographer's working group consisting of planners, disaster managers, flood management personnel
- iv. and the community to review and propose cartographic standards
- v. Enhance the standards
- vi. Convene a regional cartographers consisting of planners, disaster managers, flood management
- vii. personnel and the community to review and agree on the cartographic standards
- viii. Liaise with training institutions and appropriate government institutions for adoption of the standards
- ix. Publish and disseminate cartographic standards for wide usage

3.1 Disaster Imagination Game (DIG) technology promoted in CDERA Participating States
- i. Prepare regional DIG training manual
- ii. Undertake regional training of trainers for civil society to expose them to the technology
- iii. Develop a strategy for incorporating DIG into Community-based Disaster Management Planning in the region
- iv. Establish DIG centers/network of expertise in two (2) CDERA Participating States

6.5 Input from the Recipient Government

<CDERA side>

1. Counterpart Personnel including those from CDERA/CU, RTs (CIMH, UWI/TTMA) and NTs
   - a) Flood Hazard Mapping
   - b) Community-based Disaster Management Planning
   - c) Hydrology
2. Facilities
   - Office Space

6.6 Inputs from the Japanese Government

<Japanese side>

1. Experts

Short-term Experts
- a) Hydrological Observation/Telemetry systems
- b) Flood Analysis

2. Training in Japan

Training of counterpart personnel in Japan

3. Provision of Equipment
   - a) GIS
   - b) Hydrological monitoring
4. Budget for Project Implementation

7. Implementation Schedule

The project is intended to be a three-year project spanning the period July 2006 to June 2009.

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8. **Implementing Agency**

Name of the Agency:

Caribbean Disaster Emergency Response Agency (CDERA)

The highest decision-making body is the Council of Heads of Government, under which a Board of Directors (National Disaster Coordinators) is located. The operations unit of the Agency, the Coordinating Unit (CU) implements the day to day activities.

Budget allocated to the Agency:

Administrative budget for CDERA is below. This excludes donor funding which varies annually.

Year	Budget (US$)
2003-2004	324,464
2004 -2005	331,447
2005 -2006	331,447

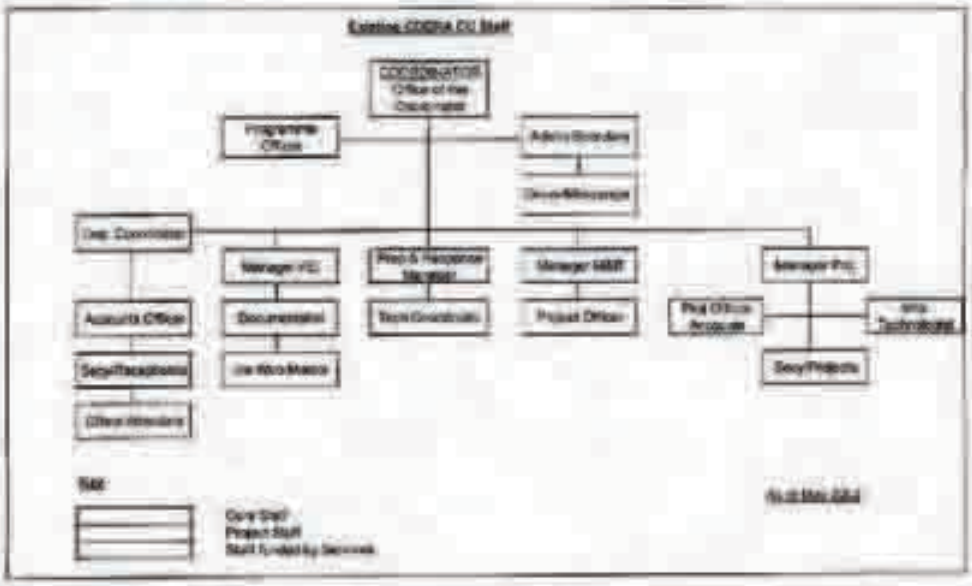

Figure 1 Organization Chart of the Agency

9. **Related Activities**

This project will implement the overall goal of the IICA funded Caribbean Disaster Management Project (2002-2006) that sinnies projects/activities to prepare hazard maps and community-based disaster management plans by utilizing hazard maps are implemented in CDERA member states and other initiatives to be undertaken in the context of the Caribbean Regional Programming Framework 2005-2015. It will also complement the Caribbean Open Trade Support (COTS) project being implemented by the United States Agency for International Development (USAID) in Dominica and Antigua and Barbuda. It will be an input to the United Nations Development Programme /Disaster Preparedness Programme (DIPECHO) project *'Fostering Knowledge Transfer and the Application of Best Practices in Disaster Preparedness and Risk Reduction within the Caribbean'*.

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Link to ongoing Initiatives

The project is part of a suite of donor support for the Comprehensive Disaster Management Strategy (CDM) and the Coordinating Unit Strategic Plan 2004-2009.

Among approved or initiatives being negotiated are:

i. The Regional Disaster Risk Management For Sustainable Tourism In The Caribbean

The 20 month project of US$800,000 has been approved by the IDB. It involves a partnership between the CTO, UWI, CROSQ and CDERA.

The objective of the project is to develop and adopt a Regional Public Good that is a regional disaster risk management framework for the tourism sector in the Caribbean.

It will deliver the following outputs:

(i) A Regional Disaster Risk Management Strategy, Plan of Action, Standards for risk mapping and vulnerability assessment to be developed.

(ii) Enhanced CDERA's capacity to provide technical assistance in disaster risk management in the tourism sector.

ii. Institutional Strengthening

The three (3) year project funded by the European Union Development Fund is valued at €3.4m.

The project seeks to promote awareness and education of risk management through mass Campaign Programmes. It will also support capacity building for the institutionalization of disaster teaching and research (b) strengthen ICT applications in disaster management, especially for emergency broadcast and information sharing (c) support the review and enhancement of disaster legislation and regulations, (d) structure contingency models for continuity in E-Government and business recovery and (e) promote cooperation with CURA, Haiti, Dominica Republic and Suriname.

It envisages partnerships with the regional stakeholders in the media, educational institutions, private sector and emergency management professionals.

iii. Institutional and Capacity Building Support For Implementation Of CDM

The project which is being finalized with ACP-EU National Disaster Facility is intended to:

i) Increase the effectiveness of CDERA and improved regional coordination
ii) Increase the effectiveness of National Disaster Organisations and improve this response capacity
iii) Enhance regional capacity for multi-hazard planning
iv) Establish coordinated mechanisms for sustaining capacity building.

iv) Establishment Of Community Early Warning System For Tsunamis

The project will seek to develop the warning and evacuation systems informed by the investment in hardware and technology for improved tsunami monitoring.

It will be integrated in the disaster planning for coastal communities.

It is a part of the ICOCARIBE Tsunamis Early Warning programme generated after the Indian Ocean Tsunamis.

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USAID/OFDA is providing US$500,000 over a 18 month period for the project which will be managed by CDERA.

This proposal to the Government of Japan, within the framework of the CARICOM-Japan Cooperation, will complement the above partner supported interventions.

It seeks to build on prior CADM interventions, recognizing the resource deficits of the region and Japan's competitive advantage.

A key outcome of this technical assistance will be the widening and deepening of the regional capacity for accelerated replication of the processes and products generated under this cooperation.

10. Gender Consideration
Both men and women will be project beneficiaries. Many households in the Caribbean are headed by women and this project through the education and preparedness actions will be an important in building the capacity for this group to reduce their vulnerability.

11. Environmental and Social Considerations
See attached Screening Format.

12. Beneficiaries
Beneficiaries are the people of the Caribbean region which are primarily small island developing states a population of 6.3 million spread across 16 countries.

13. Security Conditions
There are no security concerns in the Caribbean region.

14. Others
Victims of the flood hazard are mainly of the lower social classes. One of the objectives for the implementation of the Project is the poverty alleviation especially for the people living in habitually inundated areas

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Screening Format

Question 1: Address of a project site

Caribbean Disaster Emergency Response Agency (CDERA)

Address:	Building #1, Manor Lodge, Lodge Hill, St. Michael
Contact Person:	Jeremy Collymore, Coordinator
Tel. No:	1 246 425 0386
Fax. No:	1 246 425 8854
E-Mail	coordinatorsec@cdera.org

The operation will benefit the CDERA Participating States, who are members of the Caribbean Community (CARICOM):

Anguilla	Belize	Guyana	St. Lucia
Antigua and Barbuda	British Virgin Islands	Jamaica	St. Vincent and the Grenadines
Bahamas	Dominica	Montserrat	Trinidad and Tobago
Barbados	Grenada	St. Kitts & Nevis	Turks and Caicos islands

CDERA Member States.

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Question 2 Outline of the project

2-1 Does the project come under following sectors?

●Yes　No

If yes, please mark corresponding items.

- Mining development
- Industrial development
- Thermal power (including geothermal power)
- Hydropower, dams and reservoirs
- ●River/erosion control
- Power transmission and distribution lines
- Roads, railways and bridges
- Airports
- Ports and harbors
- Water supply, sewage and waste treatment
- Waste management and disposal
- Agriculture involving large-scale land-clearing or irrigation
- Forestry
- Fishery
- Tourism

2-2 Does the project include the following items?

Yes　●No

If yes, please mark following items.

- Involuntary resettlement　(scale:　households,　persons)
- Groundwater pumping　(scale:　m3/year)
- Land reclamation, land development and land-clearing (scale:　hectors)
- Logging　(scale:　hectors)

2-3 Did the proponent consider alternatives before request?

□Yes. Please describe outline of the alternatives.

)

●No

2-4 Did the proponent have meetings with related stakeholders before request?

●Yes　□No

If yes, please mark the corresponding stakeholders.

●Administrative body – CDERA Council

□Local residents

□NGO

●Others (JICA

Question 3

Is the project a new one or an on-going one? In case of an on-going one, have you received strong complaints etc. from local residents? No

●New - Extension to other countries

On-going(there are complaints)　On-going (there are no complaints)

Others

(　　)

Question 4 Name of laws or guidelines

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Is Environmental Impact Assessment (EIA) including Initial Environmental Examination (IEE) required for the project according to laws or guidelines in the host country?

□Yes ■No

If yes, please mark corresponding items.

□Required only IEE [□implemented, □on going, □planning]
□Required both IEE and EIA [□implemented, □on going, □planning]
□Required only EIA [□implemented, □on going, □planning]
□Others [ ]

Question 5

In case of that EIA was taken steps, was EIA approved by relevant laws in the host country? If yes, please mark date of approval and the competent authority.

□ Approved without a supplementary condition	□ Approved with a supplementary condition	□ Under appraisal

[Date of approval: Competent authority:]
□ Not yet started an appraisal process
□ Others [ ]

Question 6

If a certificate regarding the environment and society other than EIA, is required, please indicate the title of certificate.

[ ] Already certified [ ] Required a certificate but not yet done
Title of the certificate: [ ]
■Not required
□ Others [ ]

Question 7

Are following areas located inside or around the project site?

Yes■No □Not identified

If yes, please mark the corresponding items.

□ National parks, protected areas designated by the government (coast line, wetlands, reserved area for ethnic or indigenous people, cultural heritage) and areas being considered for national parks or protected areas
□ Virgin forests, tropical forests
□ Ecological important habitat areas (coral reef, mangrove wetland, tidal flats)
□ Habitat of valuable species protected by domestic laws or international treaties
□ Likely salts cumulus or soil erosion areas on a massive scale
□ Remarkable desertification trend areas
□ Archaeological, historical or cultural valuable areas
□ Living areas of ethnic, indigenous people or nomads who have a traditional lifestyle, or special socially valuable area

Question 8

Does the project have adverse impacts on the environment and local communities?

□Yes ■No □Not identified

Reason: [ ]

Question 9

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Please mark related environmental and social impacts, and describe them outlines.

☐Air pollution
☐Water pollution
☐Soil pollution
☐Waste
☐Noise and vibration
Ground subsidence
Offensive odors
☐Geographical features
☐Bottom sediment
☐Biota and ecosystem
☐Water usage
☐Accidents
☐Global warming
☐Involuntary resettlement
☐Local economy such as employment and livelihood etc.
☐Land use and utilization of local resources
☐Social institutions such as social infrastructure and local decision-making institutions
☐Existing social infrastructures and services
☐The poor, indigenous of ethnic people
☐Maldistribution of benefit and damage
☐Local conflict of interests
☐Gender
☐Children's rights
☐Cultural heritage
☐Infectious diseases such as HIV/AIDS etc.
● Others (Disaster Management)

Outline of related impacts:

The project has sought to mitigate damages in CDERA Participating States particularly for the flood hazard. The emphasis of the project on this hazard, is in keeping with the findings of the **Status of Disaster Preparedness in CDERA Participating States** conducted in May 2007 which identified floods as the most common event - occurring in 30 % of CDERA Participating States in the last five years, however in contrast only 25% of these countries have any plans in place to guide disaster management activities for this hazard address the most commonly occurring hazard in its Participating States. Flooding in the region has been a silent development killer, necessitating urgent attention, given its recurrence and impact

Question 10
Information disclosure and meetings with stakeholders

10-1 If the environmental and social considerations are required, does the proponent agree on information disclosure and meetings with stakeholders in accordance with JICA Guidelines for Environmental and Social Considerations?
●Yes ☐No

10-2 If no, please describe reasons below.

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PDM - Expansion of Caribbean Disaster Management (CADM) Project

	Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal	Disaster damage in CDEMA Participating States, particularly its damage caused by floods, is reduced.	Some items, the number of persons affected by disasters, etc. to be set by the end of the Project.	• Survey questionnaire • Number of persons affected by disasters • Data of disasters in CDEMA Participating States	
Project Purpose	Flood disaster management at Community level in CDEMA Participating States is strengthened through the introduction, promotion and practice of the Caribbean Disaster Management (CADM) Model.	• The standardized CADM Model is established and applied in CDEMA Participating States. • Number of communities applying the CADM Model. • Number of communities preparing Community-based disaster management plans.	• Report of Project activities • Results of discussions with officials in Participating States • Questionnaire survey to communities • Minutes of meetings	• Cooperation is received from CDEMA Participating States. • Cooperation is received from communities in the Project areas. • Participating States and communities maintain the organizational systems for disaster management.
Outputs	1) Methodologies and tools for Community-based disaster management (CBDM) are developed.	1-1 Methodologies and tools for CBDM are developed by the end of the Project.	1-1 Activity Progress Reports 1-2 Minutes of meetings 1-3 Training Manuals 1-4 Minutes of Regional Workshops 1-5 Questionnaire survey to communities 1-6 Project documents	• Participants are motivated to learn CBDM and the CADM Model.
	2) Capacities of Disaster Management Offices (DMOs) in CDEMA Participating States to implement CBDM are strengthened.	2-1 Capacity of Regional Coordinating Unit (RCU) to implement CBDM is strengthened by the end of the Project. 2-2 Capacity of National Disaster Coordinators (NDCs) to implement CBDM is strengthened by the end of the Project. 2-3 Geographic coverage of CBDM by NDCs is increased by the end of the Project.		
	3) Community-based Disaster Management (CBDM) training for the Core Staff in CDEMA Participating States is enhanced.	3-1 Human Resources Development (HRD) plan for CBDM is prepared by the end of the Project. 3-2 Number of trainees trained by the Core Staff.		
	4) An early warning system is established in selected communities.	4-1 Early Warning System is established in selected communities.		

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BUDGET ESTIMATE TABLE FOR JAPAN TECHNICAL CO[illegible]ERATION

Objective 1: To review, strengthen and expand hydrological observation and flood analysis technology in CDERA Participating States

No.	Item / Description		Calculation	Amount (US$)
1.1 : Hydrological monitoring stations established in six (6) CDERA Participating States				
1.1.1	Procure and install hydrological monitoring equipment for sixteen (16) CDERA Participating States	Rainfall gauge	@ 500 X 4sets X 6countries	12,000.00
		- Foundation and housing	@ 1,000 X 4sets X 6countries	24,000.00
		Water level gauge	@ 1,000 X 4sets X 6countries	24,000.00
		- Foundation and housing	@ 3,000 X 4sets X 6countries	72,000.00
		Data logger	@ 1,000 X 4sets X 6countries	24,000.00
		Laptop computer with software	@ 2,000 X 1set X 6countries	12,000.00
		Current velocity meter	@ 2,000 X 4sets [illegible]	8,000.00
1.1.2	Procure and install telemetry systems for large basins in [illegible]	Radio system (1 antenna & [illegible] relay station) + receiver + battery backup	@ 15,000 X 4sets X 4countries	320,000.00
1.1.3	Conduct hydrological observation training for National Team Members at each pilot site	Air fare of Experts and NT members	@ 500 X 3persons X 5times X 6countries	18,000.00
	(2 days, 3 instructors, 3 participants, 5 times for each country)	Travel allowances	@ 200 X 3persons X 2days X 3times X 6countries	21,600.00
		Materials	@ 10 X 3persons X 2times X 6countries	1,260.00
		Meals and breaks	@ 50 X 3persons X 2days X 3times X 6countries	17,600.00
		Miscellaneous	@ 100 X 2days X 2times X 6countries	3,000.00
1.1.4	Dispatch Japanese Short Term expert in hydrological observation	(Cost paid at JICA HQ)	@ 15,000 X 2person-months X 3times	100,000.00
1.1.5	Dispatch Japanese Short Term expert on telemetry systems	(Cost paid at JICA HQ)	@ 15,000 X 2person-month	30,000.00
Subtotal: Output 1.1				697,[illegible]
1.2 : Hydrological database established at the Caribbean Institute of Meteorology and Hydrology (CIMH) and regularly updated				
1.2.1	Conduct a study to evaluate the status of hydrological data collection and data management in CDERA Participating States and create hydrological data base	Sub-contract fee	@ 400 X 30days X 2persons	24,000.00
		Travel (air fare only)	@ 500 X 20times	10,000.00
1.2.2	Develop a web-based data collection, data management and data dissemination programme for CDERA Participating States	Sub-contract fee	@ [illegible] X [illegible]days X [illegible]persons	18,[illegible]
		Desktop computer	@ 1,500 X 1set	1,500.00
		Software	@ 3,000 X 1set	3,000.00
		Initial year running costs	@ 500 X 12months	6,000.00
1.2.3	Procure and install computer equipment, software and peripherals for collection and dissemination of hydrological data at the regional and national levels	Regional: Laptop computer and software	@ 2,000 X 2sets	4,000.00
		Printer and other peripherals	@ 1,000 X 2sets	2,000.00
		National: Laptop computer and software	@ 2,000 X 1set X 6countries	12,000.00
		Printer and other peripherals	@ 1,000 X 1set X 6countries	6,000.00
1.2.4	Conduct training in hydrological data analysis and dissemination at the regional and national levels	Regional level		
	Regional: 1 time, 3 days, 22 participants, CIMH	Air fare of participants	@ 500 X 20persons X 1time	10,000.00
		Travel allowances	@ 200 X 20persons X 4days X 1time	16,000.00
		Materials	@ 10 X 25persons X 1time	250.00
		Meals and breaks	@ 50 X 22persons X 3days X 1time	3,300.00
		Miscellaneous	@ 100 X 3days X 1time	300.00
	National: 2 days, 2 instructors, 5 participants, 3 times for each country	National level		
		Air fare of Experts and NT members	@ 500 X 2persons X 3times X 6countries	17,000.00
		Travel allowances	@ 200 X 2persons X 4days X 2times X 6countries	19,200.00
		Materials	@ 10 X 7persons X 3times X 6countries	440.00
		Meals and breaks	@ 50 X 7persons X 3days X 2times X 6countries	12,600.00
		Miscellaneous	@ 100 X 3days X 2times X 6countries	3,600.00
1.2.5	Establish MOUs with focal point organizations in CDERA Participating States for the sharing of hydrological data	Air fare of Experts and NT members	@ 500 X 2persons X 4time X 6countries	6,000.00
	(Board costs for CDERA personnel = 2 persons, 2 days, 1 time for each country)	Travel allowances	@ 200 X 2persons X 4days X 1time X 6countries	9,600.00
Subtotal: Output 1.2				1[illegible]
Objective 1 Total				877,2[illegible]

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[illegible]UDGET ESTIMATE TABLE FOR JAPAN TECHNICAL C[illegible]RATION

Objective 2: To strengthen and expand Geographic Information Systems capability for flood hazard mapping in CDERA Participating States

No.	Item / Explanation		Calculation					Amount (US$)
2.1	GIS capability of Regional Team enhanced and expanded							
2.1.1	[illegible]	Sub-contract fee	@ [illegible]	X [illegible]	X [illegible]			[illegible]
2.1.2	Conduct training for five (5) persons to build expertise and provide counterparts for RT	Air fare of Experts and RT members	@ [illegible]	X [illegible]	X [illegible]			[illegible]
		Travel allowances	@ [illegible]	X [illegible]	X [illegible]	X [illegible]		[illegible]
		Air fare of participants	@ [illegible]	X [illegible]	X [illegible]			[illegible]
	(3 times, 3 days, 1 instructor, 5 participants [illegible])	Travel allowances	@ [illegible]	X [illegible]	X [illegible]	X [illegible]		[illegible]
		Materials	@ [illegible]	X [illegible]	X [illegible]			[illegible]
		[illegible]	@ [illegible]	X [illegible]	X [illegible]	X [illegible]		[illegible]
		Miscellaneous	@ [illegible]	X [illegible]	X [illegible]			[illegible]
2.1.3	Assign five (5) new persons to Regional Team and [illegible]	Air fare of Experts and RT members	@ [illegible]	X [illegible]	X [illegible]			[illegible]
	(GIS Experts meeting, [illegible])	Travel allowances	@ [illegible]	X [illegible]	X [illegible]	X [illegible]		[illegible]
2.1.4	[illegible]	Air fare of Experts and RT members	@ [illegible]	X [illegible]	X [illegible]			[illegible]
	([illegible])	Travel allowances	@ [illegible]	X [illegible]	X [illegible]	X [illegible]		[illegible]
2.1.5	[illegible]	N/A						0.00
	Subtotal: Output 2.1							[illegible]
2.2	[illegible] flood hazard maps established							
	[illegible]	Air fare of Experts and RT members	@ [illegible]	X [illegible]	X [illegible]	X [illegible]	X [illegible]	[illegible]
		Travel allowances	@ [illegible]	X [illegible]	X [illegible]	X [illegible]	X [illegible]	[illegible]
	[illegible]		@ [illegible]	X [illegible]	X [illegible]	X [illegible]	X [illegible]	[illegible]
	[illegible]		@ [illegible]	X [illegible]	X [illegible]	X [illegible]	X [illegible]	[illegible]
	[illegible]		@ [illegible]	X [illegible]	X [illegible]	X [illegible]	X [illegible]	[illegible]
	[illegible]		@ [illegible]	X [illegible]	X [illegible]	X [illegible]	X [illegible]	[illegible]
			@ [illegible]	X [illegible]	X [illegible]	X [illegible]	X [illegible]	[illegible]
	[illegible]	Editing	@ [illegible]	X [illegible]				[illegible]
		Printing	@ [illegible]	X [illegible]				[illegible]
	Subtotal: Output 2.2							[illegible]

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BUDGET ESTIMATE TABLE FOR JAPAN TECHNICAL CO[illegible]RATION

2.3: Cartographic standards for flood hazard mapping in the Caribbean established			
2.3.1 [illegible]	Sub-contract fee	[illegible] X 10days X 1person	[illegible]
2.3.2 Recommend cartographic standards for flood hazard mapping in the Caribbean	(included in 2.3.1)		
2.3.3 Convene a cartographer's working group consisting of planners, disaster managers, flood management personnel and the community to review and propose cartographic standards [illegible]	Air fare of participants	[illegible]	[illegible]
	Travel allowances	[illegible]	[illegible]
	Materials	[illegible]	[illegible]
	Meals and breaks	[illegible]	[illegible]
	Venue	[illegible]	[illegible]
	Miscellaneous	[illegible]	[illegible]
2.3.4 Enhance the standards	Sub-contract fee	[illegible] X 10days X 1person	[illegible]
2.3.5 Convene a regional cartographers consisting of planners, disaster managers, flood management personnel and the community to review and agree on the cartographic standards [illegible]	Air fare of participants	[illegible]	[illegible]
	Travel allowances	[illegible]	[illegible]
	Materials	[illegible]	[illegible]
	Meals and breaks	[illegible]	[illegible]
	Venue	[illegible]	[illegible]
	Miscellaneous	[illegible]	[illegible]
2.3.6 Liaise with training institutions and appropriate government institutions for adoption of the standards [illegible]	[illegible]	[illegible]	[illegible]
(Travel: [illegible])	Travel allowances	[illegible]	[illegible]
2.3.7 Publish and disseminate cartographic standards for wide usage	Editing	[illegible] X 1time	[illegible]
	Printing	[illegible] X 1time	[illegible]
Subtotal: Output 2.3			[illegible]
Objective 2 Total			[illegible]

Objective 3: To enhance and broaden Community-based Disaster Management Planning capacity for the flood hazard in CDERA Participating States

Item / Description		Calculation	Amount (US$)
3.1: Disaster Information Game (DIG) technology promoted in CDERA Participating States			
3.1.1 [illegible]	Sub-contract fee	[illegible]	[illegible]
	Reproduction and dissemination	[illegible]	[illegible]
3.1.2 [illegible]	Air fare [illegible]	[illegible]	[illegible]
	Travel allowances	[illegible]	[illegible]
	Air fare of participants	[illegible]	[illegible]
[illegible]	Travel allowances	[illegible]	[illegible]
	Materials	[illegible]	[illegible]
	Meals and breaks	[illegible]	[illegible]
	Venue	[illegible]	[illegible]
	Miscellaneous	[illegible]	[illegible]
3.1.3 Develop a strategy for incorporating DIG and Community-based Disaster Management Planning [illegible]	Air fare [illegible]	[illegible]	[illegible]
	Travel allowances	[illegible]	[illegible]
3.1.4 [illegible] CDERA Participating States	DIG [illegible]	[illegible]	[illegible]
Subtotal: Output 3.1			[illegible]
Objective 3 Total			[illegible]

取扱注意

BUDGET ESTIMATE TABLE FOR JAPAN TECHNICAL C[illegible] [illegible]RATION

Objective 4: To establish an Early Warning System mechanism for the flood hazard

Item / Description			Calculation	Amount (US$)
4.1: Early Warning Systems established for six (6) CADM pilot sites				
4.1.1	Procure and install Early Warning System equipment at [illegible] sites	Simplified rain gauge at each unit	@ 500 [illegible]	12,000.00
4.1.2	[illegible] for the community [illegible] and [illegible] of equipment	Air fare of Experts and RT members	@ 500 [illegible]	[illegible]
		Travel allowances	@ 200 [illegible]	[illegible]
	(1 expert, 1 RT member, 3 days, 1 time for each community)	Meals and snacks	@ 50 [illegible]	[illegible]
		Miscellaneous	@ [illegible]	[illegible]
Subtotal: Output 4.1				[illegible]
Objective 4 Total				[illegible]

Management Support: Project Management / Administration

Item / Description			Calculation	Amount (US$)
MS1 : Project personnel				
MS1-1	Project Manager		@ [illegible] X [illegible] months	[illegible]
MS1-2	Project Officer		@ [illegible] X [illegible] months	[illegible]
MS1-3	Secretary		@ [illegible] X [illegible] months	[illegible]
Subtotal: MS1				[illegible]
MS2 : Monitoring and evaluation				
MS2-1	Monitoring mission to target countries	Air fare	@ [illegible]	[illegible]
		Travel allowances	@ 200 [illegible]	[illegible]
MS2-2	Monitoring mission by JICA	(Directly paid by JICA)	@ [illegible] X [illegible]	[illegible]
Subtotal: MS2				[illegible]
MS3 : Meetings and ceremonies				
MS3-1	Preparation meeting (JICA [illegible], CDERA [illegible], RT [illegible], 1 day, 1 time, Barbados)	Air fare	@ 500 [illegible]	[illegible]
		Travel allowances	@ 200 [illegible]	[illegible]
		Meals and snacks	@ 50 [illegible]	[illegible]
MS3-2	Inauguration ceremony (Rep. 10+2 participating states, RT 6 (overseas 5), CDERA 4, Experts 2, 1day, 1time, Barbados)	Air fare of participants	@ 550 [illegible]	[illegible]
		Travel allowance	@ 200 [illegible]	[illegible]
		Meals	@ 50 [illegible]	[illegible]
		Venue	@ 200 [illegible]	[illegible]
		Miscellaneous	@ 100 [illegible]	[illegible]
MS3-3	[illegible] participating states meeting (Rep. 10+2 participating states, RT 6 (overseas 5), CDERA 4, Experts 2, 1day, 1time, Barbados)	Air fare of participants	@ [illegible]	[illegible]
		Travel allowances	@ 200 [illegible]	[illegible]
		Meals and breaks	@ 50 [illegible]	[illegible]
		Venue	@ 200 [illegible]	[illegible]
		Miscellaneous	@ 100 [illegible]	[illegible]
MS3-4	Regional [illegible] meeting (RT 12 (9 overseas), CDERA 4, Experts 2, 2 days, [illegible] times, Barbados)	Air fare of participants	@ 500 [illegible]	[illegible]
		Travel allowances	@ 200 [illegible]	[illegible]
		Meals and breaks	@ 50 [illegible]	[illegible]
		Miscellaneous	@ 100 [illegible]	[illegible]
MS3-5	Closing ceremony (Rep. 10+2 participating states, RT 6 (overseas 5), CDERA 4, Experts 2, 1day, 1time, Barbados)	Air fare of participants	@ 500 [illegible]	[illegible]
		Travel allowances	@ 200 [illegible]	[illegible]
		Meals	@ 50 [illegible]	[illegible]
		Venue	@ 200 [illegible]	[illegible]
		Miscellaneous	@ 100 [illegible]	[illegible]
Subtotal: MS3				[illegible]

取扱注意

BUDGET ESTIMATE TABLE FOR JAPAN TECHNICAL CO-OPERATION

M54 : Other travels								
M54-1	CECTA's routine travel for inter-governmental coordination	Air fare	@ 500	X 2persons	X 3 [illegible]		X 8countries	12,000.00
		Travel allowances	@ 200	X 2persons	X 2days	X 2time	X [illegible]countries	8,000.00
M54-2	Japanese Experts' travel for regular visits to the project sites	Air fare	@ 500		X 16persons-times			8,000.00
	[illegible]	Travel allowances	@ 200		X [illegible]person-times	X 3days		10,800.00
Subtotal: M54								[illegible]
M55 : Printing and reproduction								
M55-1	Reproduction of CADM project guide reports		@ 0.25	X 100pages	x 400 copies	x 10 times		[illegible]
M55-2	Regular document photocopies		@ [illegible]	x 2000 copies	X 36months			[illegible]
Subtotal: M55								[illegible]
M56 : Communications								
M56-1	Telecommunications	Average in CADM project	@ 200	X 36months				7,200.00
M56-2	Courier	Average in CADM project	@ 200	X 36months				7,200.00
Subtotal: M56								14,400.00
M57 : Office supply and sundry								
M57-1	Stationery	Average in CADM project	@ 200	X 36months				7,200.00
M57-2	Vehicle maintenance	Average in CADM project	@ 100	X 36months				3,600.00
M57-3	Miscellaneous	Average in CADM project	@ 200	X 36months				7,200.00
Subtotal: M57								18,000.00
Management Support Total								[illegible]
Programme Support Total								[illegible]

RECORD OF DISCUSSIONS
BETWEEN
THE JAPANESE IMPLEMENTATION STUDY TEAM
AND
THE AUTHORITIES CONCERNED OF
THE GOVERNMENT OF BARBADOS
ON
JAPANESE TECHNICAL COOPERATION
FOR
THE CARIBBEAN DISASTER MANAGEMENT PROJECT PHASE 2

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 Hidetomi OI, visited Barbados and Guyana from August 5 to 12, 2008 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") in Barbados.

During its stay in Barbados and Guyana, the Team exchanged views and had a series of discussions with the officials of the Ministry of Foreign Affairs, Foreign Trade and International Business of Barbados and the Caribbean Disaster Emergency Response Agency (CDERA) with respect to desirable measures to be taken by the Governments /Organizations concerned for the successful implementation of the above-mentioned Project.

The result of discussions has been summarized as in the document attached hereto for recommendation to the governments of Barbados and Japan respectively.

Bridgetown, August 11, 2008

大井英臣

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

Mr. Samuel CHANDLER
Permanent Secretary,
Ministry of Foreign Affairs, Foreign
Trade and International Business,
Barbados

Mr. Jeremy COLLYMORE
Coordinator,
Caribbean Disaster Emergency
Response Agency

THE ATTACHED DOCUMENT

I. COOPERATION BETWEEN BOTH GOVERNMENTS

1. The Government of Barbados will cooperate with the Caribbean Disaster Emergency Response Agency (CDERA) and the Government of Japan in the implementation of the Caribbean Disaster Management Project Phase 2 (hereinafter referred to as "the Project").

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.

III. MEASURES TO BE TAKEN BY THE GOVERNMENT OF BARBADOS

1. 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.

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 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 Governments/Organizations concerned and JICA 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. TERM OF COOPERATION

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

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 risk is increased

2. OUTPUTS OF THE PROJECT

(1) Hazard maps prepared, CDM Plans prepared and implemented, Flood Early Warning Systems 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) Development and Production 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 observation, 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

ANNEX II

LIST OF JAPANESE EXPERTS

Experts in the field of

(1) Flood analysis

(2) Flood hazard mapping

(3) Flood early warning system

(4) Community disaster management

(5) Hydrological Database

ANNEX III

LIST OF MACHINERY AND EQUIPMENT

1. Computer Software
   - Hydrological Database
   - Flood Simulation
   - GIS

2. Observation Equipment
   - Rainfall Equipment
   - Water Level Gauge
   - Telemetry Equipment
   - Warning Equipment

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 six (6) months of arrival.

ANNEX V

LIST OF BARBADIAN COUNTERPART AND ADMINISTRATIVE PERSONNEL

1. Project Director
   Coordinator, CDERA

2. Project Manager
   Senior Project Officer, CDERA

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.

5. Other personnel mutually agreed on as necessary

ANNEX VI

LIST OF BUILDINGS AND FACILITIES

1. Buildings and Facilities

(1) Offices with sufficient space and necessary facilities for the Japanese experts

(2) Services such as electricity, water supply, sewerage system, telephone, etc.

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 the Following Organizations

- Caribbean Community (CARICOM)
- Ministry of Foreign Affairs, Foreign Trade and International Business, Barbados
- Caribbean Institute of Meteorology and Hydrology (CIMH)
- University of West Indies (UWI)
- National Disaster Organizations (NDOs)

Japanese Experts

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.