



Sourcebook on the Integration of Natural Hazards into the Environmental Impact Assessment Process





Disaster Mitigation Facility for
the Caribbean (DMFC)



Adaptation to Climate Change in
the Caribbean (ACCC) Project

Incorporating Disaster Risk Reduction into the Project Cycle

Sourcebook on the Integration of Natural Hazards into the Environmental Impact Assessment (EIA) Process

NHIA-EIA SOURCEBOOK



Agence canadienne de
développement international
Canadian International
Development Agency

Table of Contents

Preface.....	vi
List of Figures	vii
Annexes	viii
Acknowledgments.....	ix
Glossary.....	x
Acronyms.....	xi

Sourcebook on the Integration of Natural Hazards into the EIA Process

Section 1 Introduction

1.0	Background.....	1
1.1	Sourcebook on the Integration of Natural Hazards into the EIA Process.....	2
1.2	Rationale for incorporating natural hazards into the EIA process	3
1.3	Overview of prevalent natural hazards in the Caribbean	3
1.4	Natural hazard risk management	5
1.5	Climate variability and change	6

Section 2 Integrating Natural Hazards into the EIA process

2.0	Background.....	8
2.1	Step 1: Define Project and Alternatives	11
2.2	Step 2: Preliminary Hazard and Vulnerability Assessment.....	12
2.3	Step 3: Screening.....	15
2.4	Step 4: Scoping.....	16
2.5	Step 5: Assessment and Evaluation.....	17
2.6	Step 6: Develop environmental management plans.....	22
2.7	Step 7: Cost-Benefit Analysis.....	23
2.8	Step 8: Monitoring Programme	23
2.9	Step 9: Prepare Final Report	23
2.10	Step 10: Project Appraisal.....	23
2.11	Step 11: Implementation and Monitoring	24

Section 3 Cumulative Effects

3.0	Introduction.....	25
3.1	Cumulative Effects Defined	25
3.2	Cumulative Assessment of Natural Hazard Effects and the Environmental Impact Assessment Process	26
3.3	Cumulative Effects Assessment	26
3.4	Where is the Cumulative Effects Assessment Placed in the Environmental Impact Assessment Submission?	30

Section 4 Integrating Natural Hazards into EIAs at the National Level

4.0	Background.....	31
4.1	Possible Modalities for Incorporating Natural Hazards and Climate Change Impacts into the EIA Process.....	32
4.2	Integration of Climate Change Adaptation into the EIA Process within CARICOM Countries – Practical Considerations	32

Section 5 References	56
Annexes	58

Preface

The Sourcebook on the Integration of Natural Hazards into the Environmental Impact Assessment (EIA) Process (NHIA-EIA Sourcebook) has been developed as a collaborative effort between the Caribbean Development Bank (CDB), through its Disaster Mitigation Facility for the Caribbean (DMFC) and the Caribbean Community (CARICOM) Adapting to Climate Change in the Caribbean (ACCC) Project.

Disaster Mitigation Facility for the Caribbean

The Disaster Mitigation Facility for the Caribbean was established in CDB's Projects Department in 2000 as a partnership between CDB and the United States Agency for International Development Office of Foreign Disaster Assistance.

Designed to strengthen the capacity of CDB's 17 borrowing member countries for disaster risk reduction, the Facility has two primary objectives: (i) to strengthen CDB's institutional capacity for natural hazard risk management and (ii) to assist the Bank's 17 borrowing member countries (BMCs) with the adoption and implementation of successful disaster mitigation policies and practices.

The overall thrust of the project has been to promote the mainstreaming of disaster risk reduction into CDB-financed development projects as well as into national development planning. The primary objectives are being realized through eight principal outputs:

Objective 1:

Revised CDB disaster risk management strategy, which places greater emphasis on disaster mitigation;

Revised CDB Environmental Review Guidelines which integrate natural hazard risk considerations;

CDB Projects and Economics staff trained to identify opportunities for incorporating natural hazard risk into project formulation; and

CDB-financed capital and technical assistance projects in which natural hazard risk considerations inform project design.

Objective 2:

New/revised disaster mitigation policies and plans in BMCs;

Strengthened national and regional disaster management institutions;

More risk reduction tools and practices; and

More informed and involved natural hazard risk management stakeholders.

For further information, please visit our website:

<http://www.caribank.org> or contact info@caribank.org

Adaptation to Climate Change in the Caribbean (ACCC) Project

Adaptation to climate variations and change, and to sea level rise, is of fundamental economic and social importance to the countries of the Caribbean. The Adapting to Climate Change in the Caribbean (ACCC) Project is funded by the Canadian International Development Agency (CIDA) and was implemented during the period October 2001 to March 2004. The project builds on the initial experience gained through the Caribbean Planning for Adaptation to Climate Change (CPACC) project, which concluded in December 2001. This US\$2.1 million project involves nine individual components that continue from CPACC in order to consolidate, extend and make sustainable climate change responses. They are also designed to lead into and complement the Global Environment Facility (GEF) program, Mainstreaming Adaptation to Climate Change (MACC). The nine components of the ACCC Project include:

Component 1: Development of Business Plan for Caribbean Climate Change Centre

Component 2: Public Education and Outreach (PEO)

Component 3: Risk Management Approach to Physical Planning

Component 4: Strengthening Regional Technical Capacity

Component 5: Adaptation Planning in Environmental Assessments

Component 6: Strategies for Adaptation in the Water Sector

Component 7: Adaptation Strategies to Protect Human Health

Component 8: Adaptation Strategies for Agriculture and Food

Component 9: Fostering Collaboration with non-CARICOM Countries

The outcomes from this initiative aim to ensure that:

- The Caribbean Community Climate Change Centre becomes a sustainable institution for coordinating all climate change related activities in the Region;
- The Region builds climate change adaptation into planning and assessment processes in key economic and social sectors;
- The scientific and technical competence to address climate change issues is strengthened in the Region;
- National and regional agencies can constructively engage in international climate change negotiations; and
- Citizens, the private sector and governments of the Region have the knowledge to support and conduct appropriate climate change responses.

CARICOM countries participating in the ACCC Project:

Antigua and Barbuda	Jamaica
Bahamas	St. Lucia
Barbados	St. Kitts and Nevis
Dominica	St. Vincent and the Grenadines
Grenada	Trinidad and Tobago
Guyana	

The ACCC Project is executed through the Canadian Executing Agency (CEA) which comprises Canadian firms, de Romilly and de Romilly Limited, and GCSI – Global Change Strategies International Inc. Day-to-day implementation is the responsibility of the Regional Project Implementation Unit (RPIU), based in Barbados which was originally established for the CPACC Project. However, implementation is the full responsibility of the Caribbean Community (CARICOM) Secretariat.

For further information, please visit our website:

<http://www.caribbeanclimate.org>

© 2004 Caribbean Development Bank

All rights reserved. No part of this publication may be photocopied, recorded or otherwise reproduced, stored in a retrieval system or transmitted in any form or by any electronic or mechanical means without the prior permission of the copyright owner.

Note: This document is a work in progress. Comments and suggestions for improvement of the document are welcome and should be submitted to the Caribbean Development Bank, P.O. Box 408, Wildey, St. Michael, Barbados at Telephone: (246) 431-1600, Telefax: (246) 426-7269 or Email: info@caribank.org.

It is recommended that reference to this document should be made as follows: Caribbean Development Bank (CDB) and Caribbean Community Secretariat (CARICOM), 2004. Sourcebook on the Integration of Natural Hazards into the Environmental Impact Assessment (EIA) Process. Caribbean Development Bank, Barbados.

List of Figures

Figure 1	Recent Disaster History in the Caribbean.....	1
Figure 2	Categories of Natural Hazard Risk Management Actions	6
Figure 3	Potentially Hazardous Natural Phenomena Associated with Climate Change and Climate Variability	7
Figure 4	EIA Flowchart	8
Figure 5	Generic Natural Hazards EIA Flowchart.....	9
Figure 6	Estimating Frequency or Probability of an Event	12
Figure 7	Potential Sources of Hazard Information	13
Figure 8	Estimating Impact Severity	14
Figure 9	Risk Management Process.....	18
Figure 10	Identification of Risk Management Options	19
Figure 11	Potential Evaluation Criteria	20
Figure 12	Climate Change Adaptation Options	21
Figure 13	Status of EIA Procedures Incorporating Climate Change	31

Annexes

Section 1.	Define Project and Alternatives	60
1.0	Project Information Form	
Section 2.	Preliminary Hazards and Vulnerability Assessment	71
2.0	Overview of Inventory of Hazard and Vulnerability Assessments, Digital Data in the Caribbean	
2.1	Types and Sources of Hydrologic and Atmospheric Hazard Information	
2.2a	Types and Sources of Geologic Hazards Information	
2.2b	Additional Resources on Hazard Information in the Caribbean	
2.3	IDB Hazard Impact Checklist for Water and Sanitation Projects	
	Other checklists under development viz. Environment and Natural Resources, Transportation, Energy, Health, Housing, Education, Agriculture, Modernisation of the State, Micro-enterprise Development, may be inserted here.	
Section 3.	Screening.....	119
3.0	Risk Assessment Matrix	
Section 4.	Scoping.....	122
4.0	Sample EIA Terms of Reference (including Natural Hazard Considerations)	
Section 5.	Assessment and Evaluation	126
5.0	Handbook for Estimating Socio-Economic and Environmental Impacts of Disasters	
5.1	Establish Baseline	
5.1.1	Examples of Caribbean Hazard Assessments	
5.1.2	Status of Hazard Maps Vulnerability Assessments and Digital Maps in the Caribbean	
5.2	Predict Impacts	
5.2.1	Vulnerability Assessment of Utilities and Institutional Buildings	
5.2.2	Vulnerability and Capacity Assessment (VCA)	
5.2.3	Vulnerability Assessment Techniques and Applications (VATA)	
5.3	Evaluate Management, Mitigation and Adaptation Options	
5.3.1	Report on the Comparison of Building "Codes" and Practices	
5.3.2	Natural Hazard Risk Management Good Practices	
5.3.3	Hazard-by-Hazard Listings of Mitigation Measures	
5.4	Select Preferred Alternative	
5.5	Determine Feasibility	
5.5.1	Costs and Benefits of Hazard Mitigation for Building and Infrastructure Development: A Case Study in Small Island Developing States	
5.5.2	Costs and Benefits of Building Resilient Infrastructure: The Case of Port Zante in St. Kitts and Nevis	

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_11325

