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Dominica: Natural Disasters and Economic Development in a Small Island State

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Acronyms

AIDB	Agricultural, Industrial and Development Bank	NOAA	National Oceanographic & Atmospheric
BDD(C)	British Development Division (Caribbean)	OAS	Organization of American States
CARICOM	Caribbean Community	ODA	Overseas Development Administration (UK)
CCA	Caribbean Conservation Association	ODM	Office of Disaster Management (GoCD)
CDB	Caribbean Development Bank	OECS	Organization of Eastern Caribbean States
CDERA	Caribbean Disaster Emergency Response Agency	PAHO	Pan American Health Organization
CDMP	Caribbean Disaster Management Project	PML	probable maximum loss
CFF	Compensatory Financing Facility (IMF)	PSIP	Public Sector Investment Program
CGE	computable general equilibrium	SAC	Structural Adjustment Credit
CIDA	Canadian International Development Agency	SAF	Structural Adjustment Facility
CIMH	Caribbean Institute for Meteorology and Hydrology	SAP	Structural Adjustment Program
CPI	consumer price index	SRU	Seismic Research Unit, University of the West
CUBIC	Caribbean Uniform Building Code	UNCTAD	United Nations Conference on Trade and
DACI	Dominica Association of Industry and Commerce	UNDP	United Nations Development Program
DBMC	Dominica Banana Marketing Corporation	UNDRO	United Nations Disaster Relief Office
DCP	Dominica Coconut Products Ltd	UN-ESC	United Nations Economic and Social Council
DEXIA	Dominica Export Import Agency	USAID	United States Agency for International
DFID	Department for International Development (UK)	WINCROP	Windward Islands Crop Insurance Ltd
DMF	Disaster Management Facility (World Bank)	WTO	World Trade Organization
DPA	Dominica Port Authority		
DOMLEC	Dominica Electric Company		
DOWASCC	Dominica Water and Sewerage Company		
EC	European Commission		
EC\$	Eastern Caribbean dollars		
ECCB	Eastern Caribbean Central Bank		
ECLAC	Economic Commission for Latin America and the		
ERR	economic rate of return		
EU	European Union		
FY	financial year		
GDP	gross domestic product		
GEF	Global Environment Facility		
GNP	gross national product		
GoCD	Government of the Commonwealth of Dominica		
IADB	Inter-American Development Bank		
IDA	International Development Association (World Bank)		
IICA	Inter-American Institute for Cooperation on Agriculture		
IMF	International Monetary Fund		
MCWH	Ministry of Communications, Works and Housing (GoCD)		
NCB	National Commercial Bank		
NDFD	National Development Foundation of Dominica		
NFS	non-factor services		
NGO	non-governmental organization		

Table of Contents

Executive Summary	vi
1. Introduction.....	1
1.1 Background	1
1.2 Objectives.....	1
1.3 Method.....	2
1.4. Acknowledgements	2
2. Natural Hazards and Disasters since Independence.....	6
2.1. Tropical Storms and Hurricanes	6
2.2. Earthquakes.....	7
2.3. Volcanic Activity.....	7
2.4. Landslides and Mudslides.....	7
2.5. Other Hazards.....	7
3. Environment, Natural Hazards and Climate Change.....	8
3.1. Natural Hazards as an Environmental Phenomenon.....	8
3.2. Forests and Other Amenity Resources.....	8
3.3. Climatic Change.....	10
4. The Macroeconomy.....	12
4.1 Economic Performance and Natural Hazards	12
4.2 Economic Development Strategies	17
5. Sectoral Impacts.....	20
5.1. Agriculture, Livestock and Fisheries.....	20
5.2 Manufacturing.....	25
5.3. Tourism.....	28
5.4 Construction	32
5.5 International Financial Services.. ..	33
5.6 Sectoral Trends and Disaster Vulnerability	34
6. Infrastructure and Buildings.....	35
6.1 Vulnerability, Design Standards and Costs	35
6.2. Modernization and Investment in Infrastructure.. ..	35
6.3 Major Storm Damage and Rehabilitation Costs.....	36
6.4. Deep-Water Port at Woodbridge Bay.....	38
6.5 Sea Defenses and Storm Hazards: the Road System.....	40
6.6 Public Utilities: Telecommunications, Electricity and Water.....	41
6.7 Buildings and Housing.....	43
6.8. Overall Assessment.....	44
7. External Account.....	46
7.1. The Trade Account.	46
7.2. Storm Shocks and Banana Export Earnings.....	48
7.3 The Trade Balance and the Capital Account	49

8. Domestic Absorption	51
8.1. Investment Levels.....	51
8.2. Consumption.....	52
9. Financial Aspects	53
9.1. Banking and Credit.....	53
9.2. Inflation.....	59
9.3. Insurance and Other Financial Risk Transfer Mechanisms.....	61
10. Public Finance.....	66
10.1. Background.....	66
10.2. Impact of Natural Disasters.....	67
10.3. Implications.....	69
10.4. Road Development and Disaster-Related Public Finance Constraints.....	70
11. External Assistance and Macro Variability.....	73
12. Social Issues and Poverty	76
12.1. Demography and Human Capital.....	76
12.2. Education.....	76
12.3. Healthcare.....	76
12.4. Rural Livelihoods and Informal Labor Markets.....	77
12.5. Housing.....	78
12.6. Anti-Poverty Strategies and Natural Disasters.....	78
13. Disaster Management.....	80
13.1. Institutional Arrangements for Disaster Management.....	80
13.2. Natural Hazard Assessment and Monitoring.....	83
13.3. Building and Planning Regulation and Mitigation.....	85
14. Conclusions and Policy Implications.....	87
14.1. Natural Hazard Risks And Uncertainty.....	87
14.2. Dynamic Nature Of Vulnerability.....	88
14.3. Economic Policy Choices In Disaster Management.....	90
14.4. Natural Hazard Information And Risk Management.....	91
14.5. Economic Analysis of Natural Disasters.....	92
14.6. Wider Implications for Small State Economies.....	93
Annexes	
A. Natural Hazards and Natural Disasters: Definitions, Chronology, Storm Frequency and Reported Impacts of Recent Disasters on Dominica.....	96
A.1. Definitions: Natural Hazards, Disasters, Risks and Vulnerability.....	96
A.2. Hurricane Impacts ..., 1764-1999: a Chronology and Historical Note.....	97
A.3. History of Storms on Dominica: HURSTAT.....	98
A.4. Important Natural Disasters and Reported Impacts, 1960-1999.....	103
B. Regression Analysis Methodology.....	105
B.1. Storm Dummy Series.....	105
B.2. Gross Domestic Product.....	105
B.3. Banana Production and Export Earnings.....	106

B.4. Tourism.....	106
B.5. External Assistance.....	106
C. Public Finance.....	107
C.1. Hurricane David.....	107
C.2. Hurricane Hugo.....	109
C.3. The 1995 Storms.....	110
C.4. Mitigation and Preparedness.....	110
D. Statistical Tables.....	112
E. Program of meetings in Dominica, St. Kitts and Barbados.....	125
F. References.....	127

Boxes

4.1 Quantifying Vulnerability to External Shocks.....	13
5.1 WINCROP Banana Crop Insurance Scheme.....	23
5.2 Banking on Bananas – a Short-Sighted Strategy?.....	24
9.1 The National Development Foundation of Dominica.....	54
9.2 Disasters and the Eastern Caribbean Central Bank.....	55
9.3 Potential Regional Risk Management Arrangements.....	64
9.4 United Insurance's Mitigation Program.....	65
12.1 Fisheries – a Vulnerable Livelihood.....	78
13.1 World Bank OECS Emergency Recovery and Disaster Management Program.....	81
13.2 Public Information and Hazard Risk: the 1998-1999 Volcanic Alert.....	84

Tables

5.1 Agricultural Sector GDP: Relative Shares of Crop, Livestock, Forestry and Fisheries Sub-Sectors..	21
6.1 Housing and Infrastructure Damage from Major Tropical Storms and Rehabilitation Costs, 1979-1999 (current prices).....	37
6.2 Hurricane Damage and Rehabilitation Costs to Infrastructure and Buildings (constant 1999 prices)	38
6.3 Deep-water port, Woodbridge Bay: Investment, Reconstruction and Mitigation Costs.....	40
A.2.1 Chronology of Hurricanes Affecting Dominica 1764-1999.....	98
A.3.1 Saffir/Simpson Hurricane Scale.....	99
A.3.2 General Tropical Storm and Hurricane Statistics for Dominica 1886-1996.....	100
A.3.3 Interval Analysis for Tropical Storms and Hurricane.....	100
A.4.1 Dominica GDP by economic activity at factor cost, 1977-99.....	113
A.4.1.1 Logarithmic regression results: factors explaining variation in rates of growth of GDP, agricultural GDP and non-agricultural GDP, 1978-98.....	115
A.5.1.1 Agricultural commodity production and fish landed in Dominica, 1961-98.....	116
A.5.1.2 Dominica production and prices of 10 major crops in 1977, 1987, 1997.....	117
A.5.1.3 WINCROP insurance claims in Dominica, 1987-99.....	118
A.9.1 Dominica consumer price index, 1975-1999.....	119
A.10.1 Dominica-Recurent and capital central government revenue and expenditure, 1977/78-1999/2000.....	120
A.10.2 Dominica – Central government revenue by principal types, 1977/78-1997/98.....	121

Figures

4.1	Dominica – Annual fluctuations in GDP, agricultural GDP and non-agricultural GDP, 1978-1999.....	14
5.1	Dominica – Banana, coconut and root and tuber production, 1961-1998	22
5.2	Dominica – Fisheries production, 1961-1997....	26
5.3	Dominica – Manufacturing activity, 1978-1999.....	27
5.4	Visitors to Dominica by type, 1976-1998.....	29
5.5	Dominica – Construction activity, 1978-1999	32
7.1	Dominica – Exports and imports of goods and services, 1977-1998	48
7.2	Dominica – Export earnings by category, 1977-1997.....	47
7.3	Banana export earnings and disaster shocks, 1988-1998.....	48
7.4	Dominica – Real trade balance and capital accounts balance, 1977-1997.....	49
7.5	Dominica – Balance of payments, 1977-1997..	50
8.1	Dominica – Domestic absorption by component, 1977-1998	52
9.1	ECCB – Ratio of external assets to demand liabilities, 1987-1999	56
9.2	Dominica – Consumer price index: monthly index of all items and food, 1980-2000.....	60
10.1	Dominica – Central government local and external revenue, 1977-97/98	68
11.1	Total aid flows to Dominica, 1977-1996.....	74

Maps

1.	Dominica.....	3
2.	Dominica: Natural Hazard Vulnerability	5
3.	Hurricanes of Category 4 Affecting Dominica 1979-1999.....	6

Preface

As part of its efforts to promote disaster prevention and mitigation as an integral part of development activities, the World Bank's Disaster Management Facility (DMF) is undertaking a study on the economic and financial consequences of natural disasters, with the support of the United Kingdom's Department for International Development (DFID). The principal researchers for the study are Charlotte Benson and Edward Clay of the Overseas Development Institute (ODI) in London. Study team members from the World Bank's Disaster Management Facility include Alcira Kreimer, Margaret Arnold, Jonathan Agwe, Hager Ben-Mahmoud, and Maria-Eugenia Quintero.

The study entails a state-of-the art review and three country case studies. This document presents the findings of the first case study, undertaken in Dominica. The second case study is currently underway on disasters and public finance in Bangladesh, and the third will focus on a drought-sensitive southern African economy. A final synthesis report will draw together new evidence with that from the researchers' previous studies and other relevant literature.

The study team wishes to express its appreciation for the time so generously given and information provided during their visit by the Government of the Commonwealth of Dominica, including the then Minister of Finance, Hon. Ambrose George, the then Minister of Tourism, Hon. Charles Savarin, the then Minister of Agriculture, Planning and Development, Hon. Atherton Martin; and many officials listed in Annex E. Special thanks are also owed to Mr. Cecil Shillingford, Coordinator of the Office of National Disaster Management, for facilitating the visit to Dominica. Many others in both the public and private sectors in Dominica and Barbados, staff members of the Caribbean Development Bank (CDB), the Caribbean Disaster Emergency Response Agency (CDERA), and the Eastern Caribbean Central Bank (ECCB) also listed in Annex E provided advice and information. The team expresses its appreciation to all those listed for their helpful inputs. Special thanks are owed to Mr. Jim Dempster CBE, who prepared the maps; Dr. Lennox Honychurch, for access to his historical archives; Dr. William Aspinall, volcanologist; Ms. Polly Pattullo; and Mr. Jan Vermeiren of the Organization of American States for commenting on the draft report.

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Dominica: Natural Disasters and Economic Development in a Small Island State

EXECUTIVE SUMMARY

This country study of Dominica is the first of three studies undertaken as part of a broader research project aimed at increasing understanding of:

- the wider economic and financial impacts of natural disasters;
- factors determining the vulnerability of hazard-prone economies; and
- opportunities for mitigation.

The method of investigation is eclectic, using a mixture of quantitative and qualitative analysis to examine the economic impacts of natural hazards.

The Commonwealth of Dominica is a lower middle-income small island state in the Eastern Caribbean, of some 750 square kilometers with a population of 76,000 and per capita GDP of EC\$7,900 (US\$2,900) in 1998. Some 30% of the population was estimated as living at or below the poverty line in 1996.

Dominica is vulnerable to a wide range of natural hazards. The most common and historically most significant are tropical storms and hurricanes. Reflecting a rugged physical topography, most of the population and infrastructure are located on the coast, making Dominica particularly vulnerable to strong winds and high seas. The island is geologically extremely young and almost completely volcanic in origin. Following a volcanic alert in 1998-9, its susceptibility to future volcanic activity is also currently a major cause for concern. There is a related risk of earthquake. Landslides are a common feature of life and the landscape. Other potential hazards include drought, storm surges, floods, bush fires and tsunamis.

Many of the study findings are intuitive, even obvious. However, this is the first time that the evidence has been brought together, systematically analyzed and policy implications drawn. Dominica's economy is, with perhaps the exception of offshore financial services, highly vulnerable to tropical storms. Hurricane David in 1979 had the most catastrophic effects in modern times on the environment, economy and society, but there were severe storms too in 1989, 1995 and 1999.

The study draws a number of key conclusions.

1. **Natural hazard risks and uncertainty** - there is considerable uncertainty even about natural hazard risks, both in Dominica and more generally. For example, in 1999 the island suffered extensive damage from Hurricane Lenny, when this storm tracked from west to east on a path some 150 miles to the north. No hazard warnings were issued because storms normally approach the Caribbean from the east and are, at that distance, not expected to affect Dominica.
2. **Dynamic nature of vulnerability** - the Dominica economy's vulnerability is constantly changing, reflecting both the longer-term direction of development and capital formation in the island, and also shorter-term shifts in the structure and composition of economic activity. For example, the fall in banana production during the 1990s has (positively) reduced the potential scale of agricultural losses in a disaster. However, a more diversified agricultural sector will be less secure because crop insurance is only available for bananas, which also had an assured export market. As a further example, the scale of physical damage to the transport network is now potentially far greater and the pace of recovery could be slower due to the long-term development of a largely coastal road system without adequate sea defenses.

The study shows that a particular level or form of hazard vulnerability is not inevitable. Some sectors and sub-sectors are more vulnerable than others, whilst measures can be taken to reduce structural vulnerability. Greater integration of hazard risks into medium- and long-term economic and financial analysis and planning could substantially reduce the economy's hazard vulnerability, thus contributing to sustainable growth.

3 Economic policy choices in disaster management - in the immediate aftermath of a disaster, both government and the private sector face choices between the pursuit of rapid recovery and a reduction in longer-term hazard vulnerability. In Dominica, effectively by default, the emphasis has been on quick recovery because the political impetus and associated financial incentives for investing in mitigation and changes in land use have been insufficiently strong.

The study also highlights the tensions caused by the wide range of demands on public finance, including for funding to reduce physical vulnerability to natural hazards. Such tensions are particularly acute in this small island economy, with relatively high per capita infrastructure needs, in turn due to diseconomies of small scale and a relatively scattered population combined with a difficult and mountainous terrain. The study points to the need for improved information on the budgetary impact of disasters both to facilitate cost-effective allocation of resources and also to emphasize the importance of integrating hazard risk reduction into medium- and long-term economic and financial planning.

4. Natural hazard information and risk management – the levels and forms of hazard risk information available in Dominica have been unsatisfactory, hindering appropriate risk-averting decision making. Issues that urgently need to be addressed include ensuring sufficient investment in monitoring, assessment, mapping and dissemination activities. Public information needs to be provided in an easily understood and usable form. Achieving and sustaining such investment is particularly difficult in a small island economy, because there are economies of scale and hazard information is a regional public good.

5 Wider implications for small island states - the vulnerability of a small economy can alter quickly. The sources of change are structural, occurring within an open economy that is being driven now by exogenous forcing mechanisms – technological development, globalisation and climatic change.

In considering appropriate forms of disaster mitigation, it is important to recognize the physical characteristics of the island(s) which underlie the economy and society. This study reconfirms the substantial value added in disaster mitigation investment in key infrastructure. The encouragement of less vulnerable areas of activity will facilitate long-term sustainable development by buffering medium-term growth from the effects of disaster shocks.

The role of catastrophe insurance and other financial risk-spreading mechanisms in spreading and reducing risk also needs to be enhanced significantly in the Caribbean and increased use should be made of such mechanisms as a tool for promoting hazard mitigation.

Donors need to address their own problems of coherence and overstretch in working with small island states by adopting joint programs, agreeing lead agencies on projects, supporting regional solutions and reducing micro-management of projects.