
PREFACE

The CARICOM Environment in Figures 2004 has been prepared by the Caribbean Community (CARICOM) Secretariat, Statistics Sub-programme based on data submitted by Member States and Associate Members, from the United Nations Statistics Division (UNSD) and from other regional and National Organisations. This is the second report in this area of Statistics that has been produced. The first report contained data up to the period 2002. The work on Environmental Statistics in the CARICOM Region was stimulated by a Project on "Strengthening Capacity in the Compilation of Statistics and Indicators for Conference Follow-up in the CARICOM Region," jointly carried out by the United Nations Statistics Division (UNSD) and the Caribbean Community (CARICOM) Secretariat from 1999 - 2003. The Project was executed in the CARICOM Member States, which are Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Kitts and Nevis, Saint Lucia, St. Vincent and the Grenadines, Suriname and Trinidad and Tobago. However relative to data collection and capacity building activities the Associate Members were also included in these efforts and data for some of these countries are found in this publication.

Of importance to note is the work of the CARICOM Advisory Group which operated in the area of Social/Gender and Environmental Statistics, developing a programme for sustaining the data collection, compilation and dissemination efforts post the end of the CARICOM/UNSD Project.

As expressed in the first report, it continues to be the case that in the CARICOM Region, most of the 15 Member States are faced with growing competition between economic interests for limited natural resources, pressures from increasing tourism and a greater frequency of natural disasters. Sound policy decisions must be made using timely and reliable information to enable sustainable development. This regional report is the second attempt to compile Environmental Statistics and there were many challenges faced

including the absence of dedicated staff to work in this area both at the regional and national levels, as well as a lack of basic environmental statistics and indicators which is a relatively new area of statistics to the region. As a consequence this report which contains data up to 2004 (with some data for 2005) is only now being published in 2008. Nonetheless, some countries such as Belize, Jamaica and Suriname continue to make tremendous efforts to produce these statistics. Trinidad and Tobago recently produced its first compendium in this area of statistics.

This publication relies as stated earlier on available data submitted by Member States as well as under a collaborative arrangement with the UNSD for selected themes. The design of this publication presents metadata, a brief evaluation and assessment of the data and the tables and graphs of the various statistics and indicators. The publication focuses on twelve (12) themes which are: Population and Households, Tourism, Environmental Health, Natural Disasters, Energy and Minerals, Land Use and Agriculture, Coastal and Marine Resources, Biodiversity, Forest, Air, Waste and Water.

For each theme, the indicators are identified and for each indicator, information and analysis as required are presented on: Concepts and Definitions, Method of Computation, Indicator Relevance, Data Assessment, Data Sources and Evaluation (of the data). An estimate of the degree of harmonisation of the data is also attempted as an indicator of the comparability of the statistics across member states. It is expected that, as this area of statistics becomes more established, concepts, definitions, classifications and methods of data collection should become increasingly more harmonised and standardised. The environmental indicators that correspond to Millennium Development Goals indicators are also identified in the report.

This report took a considerable time to produce, from the initial efforts of the CARICOM Advisory Group (now the Advisory Group on Statistics) to review and develop the programme in this area; the review and refinement of core indicators and the identification of additional indicators; the design and submission of table formats to member countries; the monitoring of the submission of the information; the compilation

of the statistics and indicators in tables and the submission to countries for review and amendments and the preparation of various drafts of the report.

In view of the fact that environment statistics is a relatively new and emerging field of statistics, with a large number of data sources and institutions involved, and with a lack of benchmarks and standards, it is anticipated that the publication would help bring to the fore some of the problems that exist with these data; differences in data at the national level and at the regional level; data that exist within various organisations at the national level but are not available at the CARICOM Secretariat. The need for increased inter-agency collaboration and the use of software such as the United Nations-based Devinfo to facilitate the compilation and dissemination of statistics that are available within agencies at the national levels must be emphasised as primary mechanism of improving data availability.

The CARICOM Secretariat therefore welcomes feedback and as well data presented as missing or inaccurately presented or updated data from countries and organisations. It is hoped that this publication could contribute to providing a picture of some aspects of the status of the environment as well as in improving the data collection and compilation efforts in the Region.

ACKNOWLEDGEMENTS

Data were collected from several sources during the preparation of this report. The CARICOM Secretariat, therefore, wishes to acknowledge and thank those Organizations and persons for their invaluable contribution in supplying the data either by means of printed publications or through direct contact. Among these sources are the National Statistical Offices of Member States and Associate Members. The Secretariat looks forward to the continued support of these Organizations in the preparation of future editions of this report.

Sincere thanks and appreciation are also extended to the staff of the Statistics subprogramme for their tireless efforts in compiling and preparing the report.

Specifically, special mention must be made of the Intern that worked in the Statistics Sub-programme for the Summer of 2007 for her tremendous data-collection, research and analytical efforts which enabled the realisation of this publication.

TABLE OF CONTENTS

Preface	i
Acknowledgements.....	iv
Table of Contents.....	v
List of Tables	xi
List of Charts	xv
Abbreviations and Acronyms	xx
Notes and Symbols	xxiii

CHAPTER 1: POPULATION AND HOUSEHOLDS

PH1: Number of Households by Type of Dwelling.....	1
PH2: Number of Households by Type of Tenure	11
PH3: Number of Households by Type of Material of Outer Walls	18
PH4: Number of Households by Type of Material Used for Roofing	26
PH5: Households by Number of Bedrooms.....	32
PH6: Population by Size of Household.....	38

Appendix 1.1	44
--------------------	----

Appendix 2.1	49
--------------------	----

CHAPTER 2: TOURISM

TOR1(a): Tourist Arrivals by Type of Arrival and Number of Tourist Nights Spent.....	57
-----------------------------------------------------------------------------------------	----

TOR1(b): Tourist Intensity/Growth Rate and Tourist Penetration Ratio	65
----------------------------------------------------------------------------	----

TOR2: Number of Hotels Classified by Size, Beds and Rooms by Year.....	69
------------------------------------------------------------------------	----

TOR3: Visitor Expenditure.....	75
--------------------------------	----

TOR4: Tourist Arrivals by Type of Accommodation.....	83
------------------------------------------------------	----

TOR5: Tourist Arrivals by Country of Origin.....	92
--------------------------------------------------	----

Appendix 1.2	104
--------------------	-----

Appendix 2.2	110
--------------------	-----

CHAPTER 3: ENVIRONMENTAL HEALTH

EH1: Number of Reported Cases and Incidence of Environmentally Related Diseases	116
------------------------------------------------------------------------------------------	-----

EH2: Number of Households by Type of Sanitation Facilities	127
------------------------------------------------------------------	-----

EH3: Number of Households by Type of Water Supply133

Appendix 1.3.....140

CHAPTER 4: NATURAL DISASTERS

ND1: Natural Disasters by Year144

Appendix 1.4150

Appendix 2.4152

CHAPTER 5: ENERGY AND MINERALS

EM1: Energy Consumption by Type and Year.....153

EM2: Number of Households by Type of Fuel Used for Cooking.....159

EM3: Number of Households by Type of Fuel Used for Lighting.....165

EM4: Mineral Production by Type171

EM5: Mineral Reserves by Type176

Appendix 1.5179

CHAPTER 6: LAND USE AND AGRICULTURE

LA1: Land Use.....186

LA2: Use of Fertilizers by Type and Year.....	194
LA3: Use of Pesticides by Type and Year.....	197
Appendix 1.6	201
Appendix 2.6	201
 CHAPTER 7: COASTAL AND MARINE RESOURCES	
MR1: Total and Protected Marine Area.....	205
MR2: Fish Landings by Type and Boat Days.....	208
MR3: Population of Coastal Area.....	214
Appendix 1.7	216
Appendix 2.7	216
 CHAPTER 8: BIODIVERSITY	
BIO1: Protected Area as a Percentage of Total Area	220
Appendix 1.8.....	225
Appendix 2.8.....	225

CHAPTER 9: FOREST

FOR1: Protected Forest Area as a Percentage of Total Land Area	227
Appendix 1.9	232
Appendix 2.9	232

CHAPTER 10: AIR

AIR1: Emissions of Sulfur Dioxide (SO ₂)	234
AIR 2: Emissions of Nitrogen Oxides (NO _x)	238
AIR 3: Emissions of Non-Methane Volatile Organic Compounds (NM-VOCs)	241
AIR 4: Emissions of Carbon Dioxide (CO ₂):	244
AIR 5: Emissions of Methane (CH ₄)	247
AIR 6: Emissions of Nitrous Oxide (N ₂ O)	250
AIR 7: Emissions of Lead (Pb) and Consumption of Leaded Petrol.....	253
Addendum	255
Appendix 10.1	257

CHAPTER 11: WASTE

WA1: Generation of Waste by Type and Sector	261
WA2: Treatment and Disposal of Municipal and Hazardous Waste by Type and Method	266
Addendum.....	271
Appendix 1.11.....	274

CHAPTER 12: WATER

WT1: Renewable Fresh Water Resources	276
WT2: Water Abstraction by Source.....	280
WT3: Water Use by Supply Category and Activities.....	287
WT4: Waste Water Generation.....	291
WT5: Waste Water Treatment Facilities	293
WT6: Water Quality of Selected Rivers	296
WT7: Water Quality in Coastal Areas.....	302
Appendix 1.12.....	306

LIST OF TABLES

1.1(a) Number of Households by Type of Dwelling: 2000 Round of Census	4
1.1(b) Percentage distribution of Households by Type of Dwelling: 2000 Round of Census	6
1.2(a) Number of Households by Type of Tenure: 2000 Round of Census.....	14
1.2(b) Percentage Distribution of Households by type of Tenure: 2000 Round of Census	15
1.3(a) Number of Households by Type of Material of Outer Walls: 2000 Round of Census	20
1.3(b) Percentage Distribution of Households by Type of Materials of Outer Walls: 2000 Round of Census	22
1.4(a) Number of Households by Type of Material Used for Roofing: 2000 Round of Census	28
1.4(b) Percentage Distribution of Households by Type of Material Used for Roofing: 2000 Round of Census	29
1.5(a) Number of Households by Number of Bedrooms: 2000 Round of Census.....	34
1.5(b) Percentage Distribution of Households by Number of Bedrooms: 2000 Round of Census	35
1.6(a) Number of Households by Size of Household – 2000 Round of Census	40

1.6(b) Percentage Distribution of Households by Size of Household: 2000 Round of Census	41
2.1(a) Tourists, Same-day Visitors, Cruise ships arrivals and Average/Number of Tourist nights spent by year: 1990, 1995, 1998-2004	60
2.1(b) Tourist Intensity/Growth Rate and Tourist Penetration Ratio: 1990, 1995, 1998-2004	67
2.2 Number of Hotels Classified by Size, Beds and Rooms by Year: 1990, 1995, 1998 – 2004.....	72
2.3 Visitor expenditure and Number Employed in Tourism: 1990, 1995, 1998 – 2004.....	79
2.4(a) Tourist Arrivals by Type of Accommodation: 1990, 1995, 1998 – 2004.....	86
2.4 (b) Percentage Distribution of Tourist Arrivals by Type of Accommodation: 1990, 1995, 1998 – 2004.....	88
2.5(a) Tourist Arrivals by Country of Origin: 1990, 1995, 1998 – 2004.....	96
2.5(b) Percentage Distribution of Tourist Arrivals by Country of Origin: 1990, 1995, 1998 – 2004.....	99
3.1 Number of Reported Cases and Incidence of Environmentally Related Diseases: 1998 – 2004.....	121
3.2(a) Number of Households by Type of Sanitation Facilities: 2000 Round of Census	129
3.2(b) Percentage Distribution of Households by Type of Sanitation Facilities:	

2000 Round of Census	130
3.3(a) Number of Households by Type of Water Supply: 2000 Round of Census.....	136
3.3(b) Percentage Distribution of Households by Type of Water Supply: 2000 Round of Census	137
4.1 Natural Disasters by Year: 1960 - 2005.....	148
5.1 Energy Consumption by Type and Year: 1990, 1995, 1998 – 2004.....	157
5.2(a) Number of Households by Type of Fuel Used for Cooking: 2000 Round of Census	161
5.2(b) Percentage Distribution of Households by Type of Fuel Used for Cooking: 2000 Round of Census	162
5.3(a) Number of Households by Type of Fuel Used for Lighting: 2000 Round of Census	167
5.3(b) Percentage Distribution of Households by Type of Fuel Used for Lighting: 2000 Round of Census	168
5.4 Mineral Production by Type: 1990 – 2004	174
5.5 Mineral Reserves by Type: 1998 – 2003	178
6.1(a) Land Use: 1970, 1978, 1980, 1985, 1990, 1995 – 1996, 1999 – 2000, 2002.....	190
6.1(b) Percentage Distribution of Land Use: 1970, 1978, 1980, 1985, 1990, 1995 – 1996,	

1999 – 2000, 2002.....	192
6.2 Use of Fertilizers by Type and Year: 1990, 1995, 1998 – 2004.....	196
6.3 Use of Pesticides by Type and Year: 1990, 1995, 1998 – 2004.....	200
7.1 Total and Protected Marine Area: 1970, 1980, 1990, 2000, 2004.....	207
7.2(a) Fish Landings by Type: 1990, 1995 – 2004	209
7.2(b) Fish Landings by Boat Days: 1990, 1995 – 2004.....	213
7.3 Number of Families and Population of Population of Coastal Areas: 1980, 1985, 1990, 1995, 2000 – 2001, 2004.....	215
8.1 Protected Area as a Percentage of Total Area: 1970, 1980, 1990, 1995, 1998 – 2004.....	223
9.1 Protected Forest Area as a Percentage of Total Land Area: 1980, 1989 – 1990, 1995, 1998 – 2004.....	231
10.1(a) Emissions of Sulphur Dioxide (SO ₂): 1990, 1994 and 1996	236
10.1(b) Emissions of Sulphur Dioxide (SO ₂) from Energy Activities: 1990, 1994 and 1996.....	236
10.2(a) Emissions of Nitrogen Oxides (NO _x): 1975 - 1999	239
10.2(b) Emissions of Nitrogen Oxides (NO _x) from Energy Activities: 1975 - 1999	239

10.3(a) Emissions of Non-Methane Volatile Organic Compounds (NM-VOCs):	
1990 and 1994.....	242
10.3(b) Emissions of Non-Methane Volatile Organic Compounds (NM-VOCs)	
from Energy Activities: 1990 and 1994.....	242
10.4(a) Emissions of Carbon Dioxide (CO ₂): 1981-2000, various years	245
10.4(b) Emissions of Carbon Dioxide (CO ₂) from Energy Activities:	
1981-2000, various years	245
10.5(a) Emissions of Methane (CH ₄): 1990 and 1994	248
10.5(b) Emissions of Methane (CH ₄) from Energy Activities: 1990 and 1994	248
10.6(a) Emissions of Nitrous Oxide (N ₂ O): 1990 and 1994	251
10.6(b) Emissions of Nitrous Oxide (N ₂ O) from Energy Activities: 1990 and 1994	251
10.7 Emissions of Lead (Pb) and Consumption of Leaded Petrol: 1995 – 2002.....	253
11.1 Generation of Waste by Type and Sector: 1990, 1995 - 2005.....	265
11.2 Treatment and Disposal of Municipal and Hazardous Waste	
by Type of Method: 1990, 1995 – 1997, 1999 - 2005	269
12.1 Renewable Fresh Water Resources: 1990, 1998 - 2002	279
12.2 Water Abstraction by Source: 1990, 1995 – 2005.....	284
12.3 Water Use by Supply Category and Activities: 1990, 1995 – 2005	290

12.4	Waste Water Generation: 1995 - 2002.....	292
12.5	Waste Water Treatment Facilities: 1991, 1995 – 2002.....	295
12.6	Water Quality of Selected Rivers: 1990, 1995 - 1998 and 2000 – 2002	299
12.7	Water Quality of Selected Coastal Areas: 1997, 1998 and 2000.....	304

LIST OF CHARTS

1.1.1(a)	Percentage Distribution of Households by Type of Dwelling	8
1.1.1(b)	Percentage Distribution of Households by Type of Dwelling and Member State/Associate Member	8
1.1.2	Number of Households by Type of Dwelling.....	9
1.1.3	Percentage Distribution of Households by Member State/Associate Member.....	9
1.1.4	Number of Households by Member State/Associate Member	10
1.2.1(a)	Percentage Distribution of Households by Type of Tenure.....	16
1.2.1(b)	Percentage Distribution of Households by Type of Tenure and Member State/Associate Member	16
1.2.2	Number of Households by Type of Tenure	17
1.3.1(a)	Percentage Distribution of Households by Type of Material of Outer Walls.....	24
1.3.1(b)	Percentage Distribution of Households by Type of Material of Outer Walls	

and Member State/Associate Member	24
1.3.2 Number of Households by Type of Material of Outer Walls	25
1.4.1(a) Percentage Distribution of Households by Type of Material Used for Roofing	30
1.4.1(b) Percentage Distribution of Households by Material Used for Roofing and Member State/Associate Member	30
1.4.2 Number of Households by Type of Material Used for Roofing	31
1.5.1(a) Percentage Distribution of Households by Number of Bedrooms.....	36
1.5.1(b) Percentage Distribution of Households by Number of Bedrooms and Member State/Associate Member	36
1.5.2 Number of Households by Number of Bedrooms	37
1.6.1(a) Percentage Distribution of Households by Size of Household.....	42
1.6.1(b) Percentage Distribution of Households by Size of Household and Member State/Associate Member	42
1.6.2 Number of Households by Size of Household.....	43
2.1.1 Yearly Tourist Arrivals	63
2.1.2 Tourist Arrivals by Member State and Associate Member: 1998 and 2002.....	63

2.1.3(a) Percentage Distribution of Tourist Arrivals: 1998.....	64
2.1.3(b) Percentage Distribution of Tourist Arrivals: 2002.....	64
2.1.4 Tourist Intensity/ Growth Rate: 1990, 1995, 1998-2004.....	68
2.1.5 Tourist Penetration Ratio: 1990, 1995, 1998-2004.....	68
2.2.1 Room Occupancy Rate: 2001-2003	74
2.3.1 Visitor Expenditure by Member State/Associate Member: 2001-2004.....	82
2.4.1 Percentage Distribution of Tourist Arrivals by Type of Accommodation: 1990, 1995, 1998-2004	90
2.4.2(a) Percentage Distribution of Tourist Arrivals by Type of Accommodation: 2002	90
2.4.2(b) Percentage Distribution of Tourist Arrivals by Type of Accommodation: 2004	91
2.5.1 Percentage Distribution of Tourist Arrivals by Country of Origin: 1990, 1995, 1998-2004	102
2.5.2(a) Percentage Distribution of Tourist Arrivals by Country of Origin: 1998.....	102
2.5.2(b) Percentage Distribution of Tourist Arrivals by Country of Origin: 2002.....	103
3.2.1(a) Percentage Distribution of Households by Type of Sanitation Facilities	131

3.2.1(b) Percentage Distribution of Households by Type of Sanitation Facilities and Member State/Associate Member.....	131
3.2.2 Number of Households by Type of Sanitation Facilities.....	132
3.3.1(a) Percentage Distribution of Households by Type of Water Supply.....	138
3.3.1(b) Percentage Distribution of Households by Type of Water Supply and Member State/Associate Member.....	138
3.3.2 Number of Households by Type of Water Supply.....	139
5.2.1(a) Percentage Distribution of Households by Type of Fuel Used for Cooking.....	163
5.2.1(b) Percentage Distribution of Households by Type of Fuel Used for Cooking and Member State/Associate Member	163
5.2.2 Number of Households by Type of Fuel Used for Cooking.....	164
5.3.1(a) Percentage Distribution of Households by Type of Fuel Used for Lighting.....	169
5.3.1(b) Percentage Distribution of Households by Type of Fuel Used for Lighting and Member State/Associate Member	169
5.3.2 Number of Households by Type of Fuel Used for Lighting.....	170

ABBREVIATIONS & ACRONYMS

CARICOM	Caribbean Community
AG	Antigua and Barbuda
BS	The Bahamas
BB	Barbados
BZ	Belize
DM	Dominica
GD	Grenada
GY	Guyana
JM	Jamaica
MS	Montserrat
KN	St. Kitts and Nevis
LC	Saint Lucia
VC	St. Vincent and the Grenadines
SR	Suriname
TT	Trinidad and Tobago
AI	Anguilla
BM	Bermuda
VG	The British Virgin Islands
TC	The Turks and Caicos Islands
BOD ₅	Biochemical Oxygen Demand
CaCO ₃	Limestone (Calcium Carbonate)
CaMg (CO ₃) ₂	Dolomite
CaSO ₄	Anhydrite (Anhydrous Calcium Sulphate)
CaSO ₄ ·2H ₂ O	Gypsum (Hydrated Calcium Sulphate)
CH ₄	Methane
Cl	Chloride
CO ₂	Carbon dioxide

COD	Chemical Oxygen Demand
CPI	Consumer Price Index
CTO	Caribbean Tourism Organisation
DDPH	Dissolved and Dispensed Petroleum
DDT	DichloroDiphenylTrichloroethane
DO	Dissolved Oxygen
DOC	Dissolved Organic Carbons
E/D	Embarkation / Disembarkation Cards
EMA	Environmental Management Authority
FAO	Food and Agriculture Organisation of the United Nations
FOB	Freight on Board
GIS	Geographic Information System
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
JICA	Japan International Cooperation Agency
KMnO ₄	Potassium Permanganate
K ₂ O	Potassium Oxide
LAFTA	Latin American Free Trade Association
LPG	Liquefied Petroleum Gas
MPA	Marine Protected Area
NaCl	Sodium Chloride
NH ₃	Ammonia

NO ₂	Nitrogen Dioxide
NM-VOCs	Non-Methane Volatile Organic Compounds
N ₂ O	Anthropogenic Nitrous Oxide
OECD	Organisation for Economic Cooperation and Development
OECS	Organisation of Eastern Caribbean States
OD	Ozone Depletion
PO ₄	Phosphates
P ₂ O ₅	Phosphoric Acid
Pb	Lead
SiO ₂	Silica Sand
SO ₂	Sulphur Dioxide
TCHTA	Turks and Caicos Hotel and Tourism Association
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TPO ₄	Total Phosphate
UNECLAC	United Nations Economic Commission for Latin America and the Caribbean
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNSD	United Nations Statistics Division
WC	Water Closet
WHO	World Health Organisation
Zn	Zinc

NOTES AND SYMBOLS

NOTES

Efforts were made to assess the degree of harmonization of the indicators.

Indicators that are fully harmonized are represented by “**H**” and imply that the conceptual and methodological differences among Member States/Associate Members are negligible.

Indicators that are partially harmonized are represented by “**PH**” and imply that there is harmonization among some Member States/Associate Members, but that there are also substantive differences among some of those same states or others.

“**NH**” implies that there is an absence of harmonization with regards to concepts and methodologies among Member States/Associate Members.

“**DK**” Impossible to assess.

Unless otherwise stated, the charts refer to data shown in the accompanying table.

SYMBOLS

...	Data not available
n.a	Not applicable
0	Less than half of the unit specified
-	Nil, magnitude zero