

THE CARICOM ENVIRONMENT IN FIGURES 2004



Bahamas

Haiti

Jamaica

Antigua
& Barbuda

St. Kitts
& Nevis

Montserrat

Belize

Dominica

St. Lucia

St. Vincent
& the Grenadines

Barbados

Grenada

Trinidad
& Tobago

Guyana

Suriname



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Regional Statistics Sub-Programme

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Caribbean Community Secretariat
Greater Georgetown, 2008

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.

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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

PH1: NUMBER OF HOUSEHOLDS BY TYPE OF DWELLING PH

Concept and Definition

The household is defined as follows: (a) a one-person household, defined as an arrangement in which one person makes provisions for his or her own food or other essentials for living without combining with any other person to form part of a multi-person household; and (b) a multi-person household, defined as a group of two or more persons living together and who make **common** provisions for food or other essentials for living. The persons in the group may pool their incomes and have a common budget. They may be related or unrelated or a combination of both related and unrelated. (*Please refer to the United Nations Principles and Recommendations for Population and Housing Censuses, Revision 1 (1998).*)

A conventional dwelling is a room or suite of rooms and its accessories in a permanent building or structurally separated part thereof which, by the way it has been built, rebuilt or converted, is intended for habitation by one household and is not, at the time of the census, used wholly for other purposes. It should have separate access to a street (direct or via a garden or grounds) or to a common space within the building (staircase, passage, gallery and so on). Examples of dwellings are houses, flats, suites of rooms, apartments and so forth. (*Please refer to the United Nations Principles and Recommendations for Population and Housing Censuses, Revision 1 (1998) paras: 2.320-2.365.*)

Types of Dwellings

An Undivided Private House is a single dwelling unit, which takes up the whole building. It may be occupied by one or more households.

Part of a Private House occurs where the household occupies only a part of a private house and it may consist of one or more rooms.

Flat/Apartment/Condominium relates to self-contained dwellings in a single- or multi- storied building. Each such dwelling has separate and direct access to the street or a commercial staircase, passage, veranda, gallery or similar structure.

A *Town House* is similar to a flat, apartment or condominium except that the rooms are usually on two floors. It is a self-contained unit with separate legal title to ownership. Sometimes common facilities such as security and ground may be shared.

Double House/Duplex is a dwelling, which is joined to only one other dwelling, separated by a wall extending from ground to roof.

Combined Business and Dwelling: In this type of dwelling, the household occupies a part of the building for living purposes while the other parts are used for commercial purposes.

Barracks: This is a room or division in a long building containing several independent private dwellings, with or without shared facilities.

Other: This category is used for households living in a dwelling type not elsewhere specified. It includes boats, tents, trailers, etc.

Method of Computation

The number of households by type of dwelling is classified from data obtained from the 2000 Round of Census according to the categories: Undivided private house, Part of a private house, Flat/Apartment/Condominium, Townhouse, Double House/Duplex, Combined Business & Dwelling, Barracks, Other and Not Stated, which have been defined in the foregoing section.

Indicator Relevance

The increase in the number of households and reduction in average household size has far reaching environmental implications, including:

- Changes in land use as more dwellings are needed;
- Increasing quantities of goods needed, such as cookers, washing machines, refrigerators, televisions, telephones, cars, and computers, and the products (e.g. detergents) and services associated with them; consequently, a rise in total energy and water consumption;
- A demand for smaller-sized packs of groceries and other products leading to increased packaging waste material;
- Increase in transport (shopping and leisure trips); and,
- Increased waste.

Data Assessment

Data on households were obtained from data submitted by Member States and Associate Members. It should be noted that only one of the reporting countries explicitly followed the international definition of a household. This country was Jamaica. Other countries, like Barbados, Bermuda, Dominica and Trinidad and Tobago, followed the internationally recommended definition of a household but did so implicitly. That is to say that while Jamaica explicitly specified that members of a household must make common provision for food and other essentials for living, Barbados, Bermuda, Dominica and Trinidad and Tobago, etc only specified that members of a household should be living together in a dwelling unit and share meals. It is recognized, however, that living together and sharing meals can be interpreted as making provision for food and other essentials for living. All other requirements of a household were explicitly satisfied in the definitions used by Member States and Associate Members. The concept of a household is, therefore, in accordance with the international definition and is regionally harmonized for those countries providing these definitions.

Of the seventeen countries that provided data for this indicator, only eleven provided the definition that was used for the concept of a dwelling. Guyana, Jamaica, Saint Lucia, Suriname

and Trinidad and Tobago, out of eleven countries that provided their definitions for a dwelling, strictly followed the internationally recommended definition. Guyana and Jamaica are the only reporting countries that explicitly state that a dwelling can have one or more households. All of the other reporting countries did not specify whether a dwelling is intended to be occupied by one household or by one or more households. Antigua and Barbuda and Anguilla also neglected to specify that a dwelling must have *separate access to a street or common space within the building* in their definition of a dwelling. As such, the concept of a household is partially harmonized within the Region.

Data Sources

Please refer to the **Appendix 2.1.1 (a)** for the sources of the data on the dwelling of households of Member States and Associate Members.

Evaluation

In CARICOM Member States, 79 per cent of the households lived in an *undivided private house* as compared to 34.8 per cent of households in Associate Member States during the 2000 Round of Census. Households in Grenada (90.3 per cent) and Antigua and Barbuda (89 per cent) were more likely to live in an *undivided private house* than in Bermuda (26.7 per cent). Among Associate Members, Anguilla and The Turks and Caicos Islands, reported that the largest proportion of households living in *undivided private houses* (72.7 per cent and 48.1 per cent respectively).

More households in Associate Members lived in *flats/apartments/condominiums* (56.7 per cent) with Bermuda and The British Virgin Islands reporting the highest proportion of households (70.2 per cent and 51.3 per cent respectively) followed by The Turks and Caicos Islands (37.2 per cent). Among Member States, *flats/apartments/condominiums* were the second most common type of dwelling overall (13.1 per cent) and highest in Barbados (11.2 per cent), The Bahamas (16.6 per cent), Jamaica (16.8 per cent) and Trinidad and Tobago (13.6 per cent).

The proportion of households in CARICOM Region living in a *part of a private house* was 2.9 per cent, with Guyana (14.2 per cent) reporting the highest proportion of households living in this type of dwelling. 19.7 per cent of Bahamian households lived in a *double house/duplex*, the highest proportion for the Region, while the overall percentage for this type of dwelling was 2.3 per cent.

Table 1.1 (a) Number of Households by Type of Dwelling: 2000 Round of Census

Country	Year	Undivided Private House	Part of a private house	Flat/ Apartment / Condominium	Townhouse	Double house/ duplex
AG	2001	18,198	684	1,078		185
BS	2000	54,226	1,389	14,597	...	17,306
BB	2000	73,031	...	9,319	...	...
BZ	2000	43,490	2,735	1,412	...	2,041
DM	2001	18,036	2,255	1,066	20	484
GD	2001	30,219	1,802	507	58	109
GY	2002	129,648	25,950	13,582	1,474	5,317
JM	2001	607,903	...	125,878	...	...
MS	2001	1,814	113	93	-	181
KN	2001	12,457	1,556	906	14	169
LC	2001	37,746	4,383	2,922	236	236
VC	2001	25,805	2,920	664	9	30
TT	2000	235,000	2,968	41,234	2,043	11,585
TOTAL MEMBER STATES		1,287,573	46,755	213,258	3,854	37,643
ASSOCIATE MEMBERS						
AI	2001	2,710	192	571		125
BM	2000	6,717	...	17,655	...	...
VG	2001	2,578	1,083	4,298	35	31
TC	2001	3,486	61	2,699	102	220
TOTAL ASSOCIATE MEMBERS		15,491	1,336	25,223	137	376
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		1,303,064	48,091	238,481	3,991	38,019

Table 1.1 (a) Cont'd. Number of Households by Type of Dwelling: 2000 Round of Census

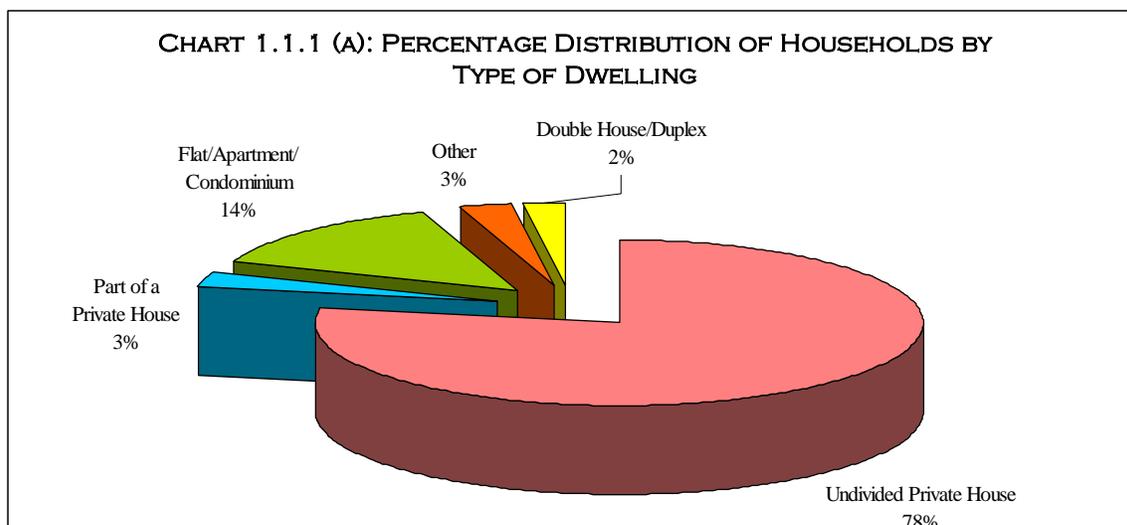
Country	Year	Combined business & dwelling	Barracks	Other	Not stated	Total all Households
AG	2001	229	17	59		20,450
BS	2000	...	...	224		87,742
BB	2000	486	122	68		83,026
BZ	2000	1,375	650	242		51,945
DM	2001	377	57	64		22,359
GD	2001	674	27	81		33,477
GY	2002	4,259	446	1,393	540	182,609
JM	2001	5,115	...	9,430	...	748,326
MS	2001	23	-	105		2,329
KN	2001	310	164	104		15,680
LC	2001	942	188	471		47,124
VC	2001	451	262	121		30,262
TT	2000	3,925	448	6,043	625	303,871
TOTAL MEMBER STATES		18,166	2,381	18,405	1,165	1,629,200
ASSOCIATE MEMBERS						
AI	2001	125		7		3,730
BM	2000	306	...	470		25,148
VG	2001	175	48	138		8,386
TC	2001	...	424	262		7,254
TOTAL ASSOCIATE MEMBERS		606	472	877	-	44,518
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		18,772	2,853	19,282	1,165	1,673,718

**Table 1.1 (b) Percentage distribution of Households by Type of Dwelling:
2000 Round of Census**

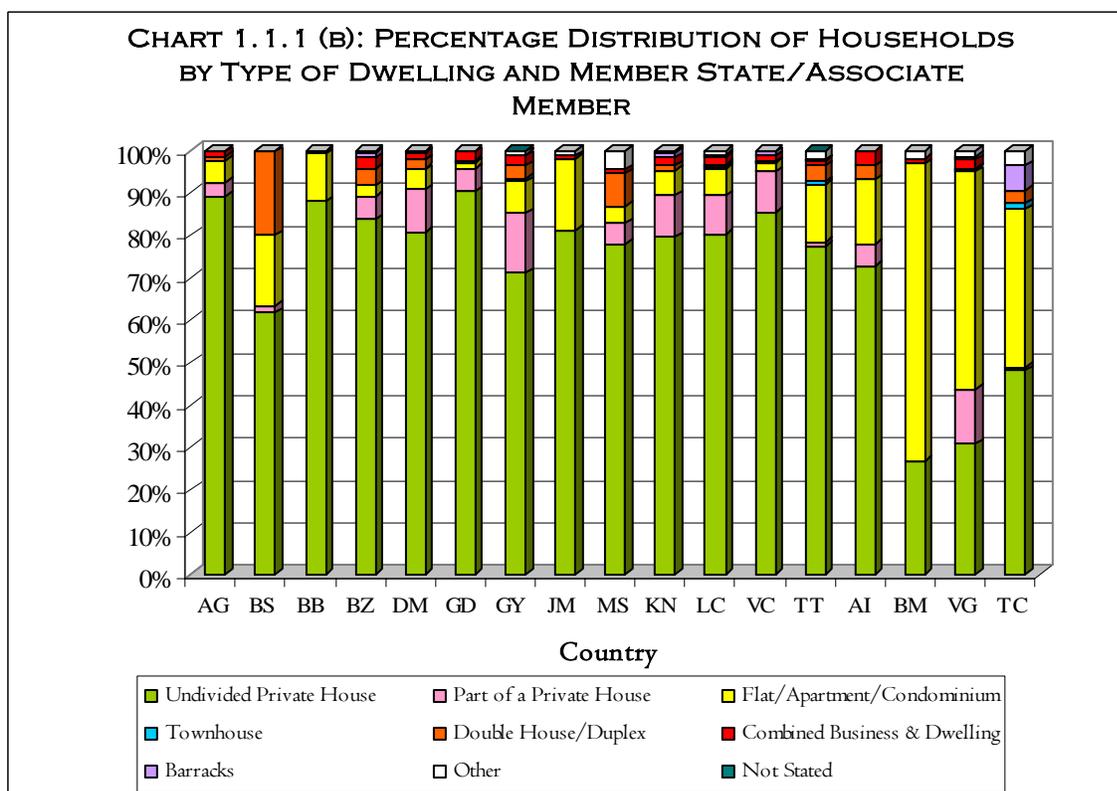
Country	Year	Undivided Private House	Part of a private house	Flat/ Apartment / Condominium	Townhouse	Double house/ duplex
AG	2001	89.0	3.3	5.3		0.9
BS	2000	61.8	1.6	16.6	...	19.7
BB	2000	88.0	...	11.2	...	...
BZ	2000	83.7	5.3	2.7	...	3.9
DM	2001	80.7	10.1	4.8	0.1	2.2
GD	2001	90.3	5.4	1.5	0.2	0.3
GY	2002	71.0	14.2	7.4	0.8	2.9
JM	2001	81.2	-	16.8	...	...
MS	2001	77.9	4.9	4.0	-	7.8
KN	2001	79.4	9.9	5.8	0.1	1.1
LC	2001	80.1	9.3	6.2	0.5	0.5
VC	2001	85.3	9.6	2.2	0.0	0.1
TT	2000	77.3	1.0	13.6	0.7	3.8
TOTAL MEMBER STATES		79.0	2.9	13.1	0.2	2.3
ASSOCIATE MEMBERS						
AI	2001	72.7	5.1	15.3		3.4
BM	2000	26.7	...	70.2	...	...
VG	2001	30.7	12.9	51.3	0.4	0.4
TC	2001	48.1	0.8	37.2	1.4	3.0
TOTAL ASSOCIATE MEMBERS		34.8	3.0	56.7	0.3	0.8
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		77.9	2.9	14.2	0.2	2.3

**Table 1.1 (b) Cont'd. Percentage distribution of Households by Type of Dwelling:
2000 Round of Census**

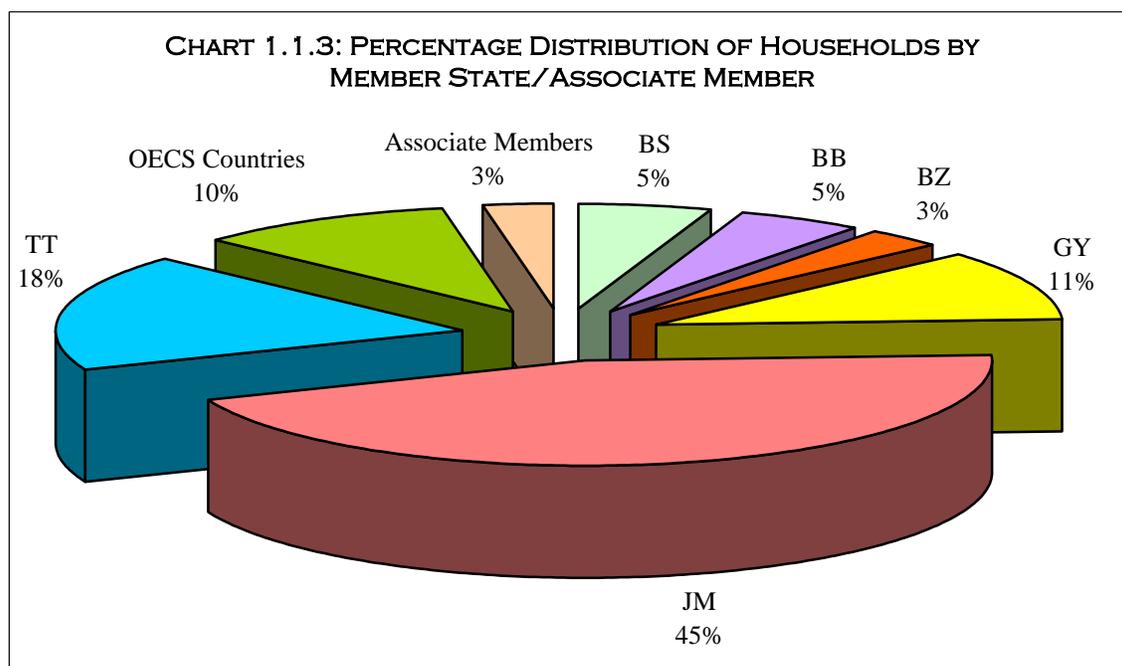
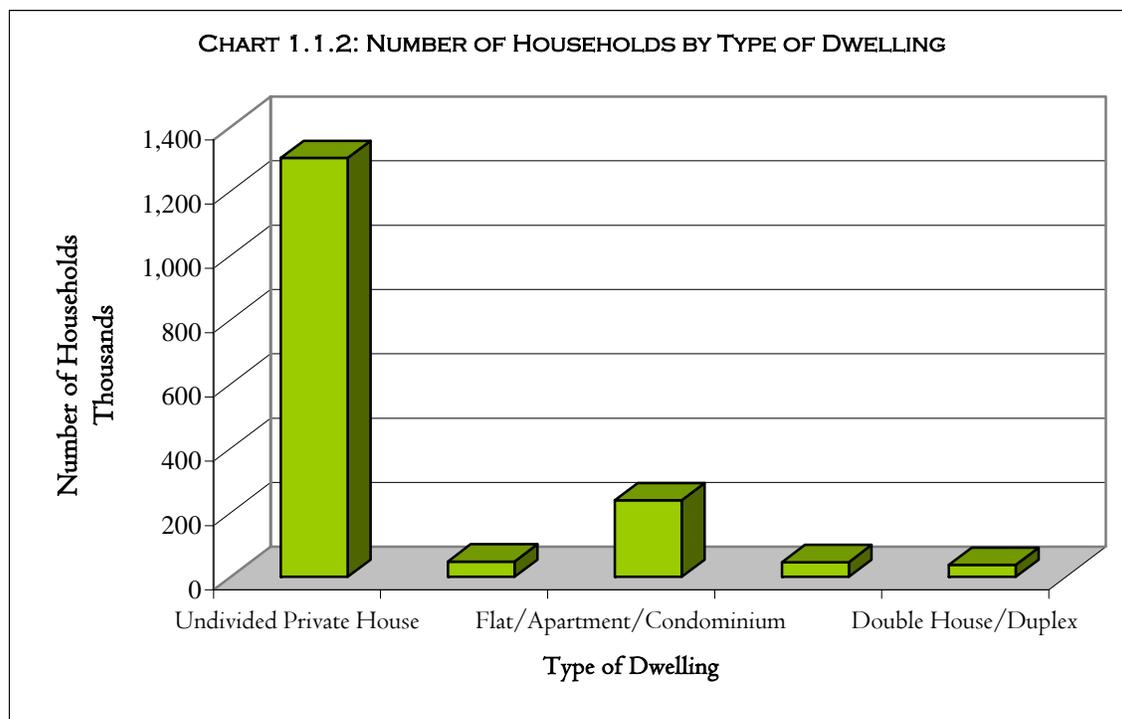
Country	Year	Combined business & dwelling	Barracks	Other	Not stated	Total all Households
AG	2001	1.1	0.1	0.3		100.0
BS	2000	...	...	0.3		100.0
BB	2000	0.6	0.1	0.1		100.0
BZ	2000	2.6	1.3	0.5		100.0
DM	2001	1.7	0.3	0.3		100.0
GD	2001	2.0	0.1	0.2		100.0
GY	2002	2.3	0.2	0.8	0.3	100.0
JM	2001	0.7	...	1.3	...	100.0
MS	2001	1.0	-	4.5		100.0
KN	2001	2.0	1.0	0.7		100.0
LC	2001	2.0	0.4	1.0		100.0
VC	2001	1.5	0.9	0.4		100.0
TT	2000	1.3	0.1	2.0	0.2	100.0
TOTAL MEMBER STATES		1.1	0.1	1.1	0.1	100.0
ASSOCIATE MEMBERS						
AI	2001	3.4		0.2		100.0
BM	2000	1.2	...	1.9		100.0
VG	2001	2.1	0.6	1.6		100.0
TC	2001	...	5.8	3.6		100.0
TOTAL ASSOCIATE MEMBERS		1.4	1.1	2.0	-	100.0
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		1.1	0.2	1.2	0.1	100.0



Note: Other includes Townhouse, Combined Business & Dwelling, Barracks, Not Stated and Other.

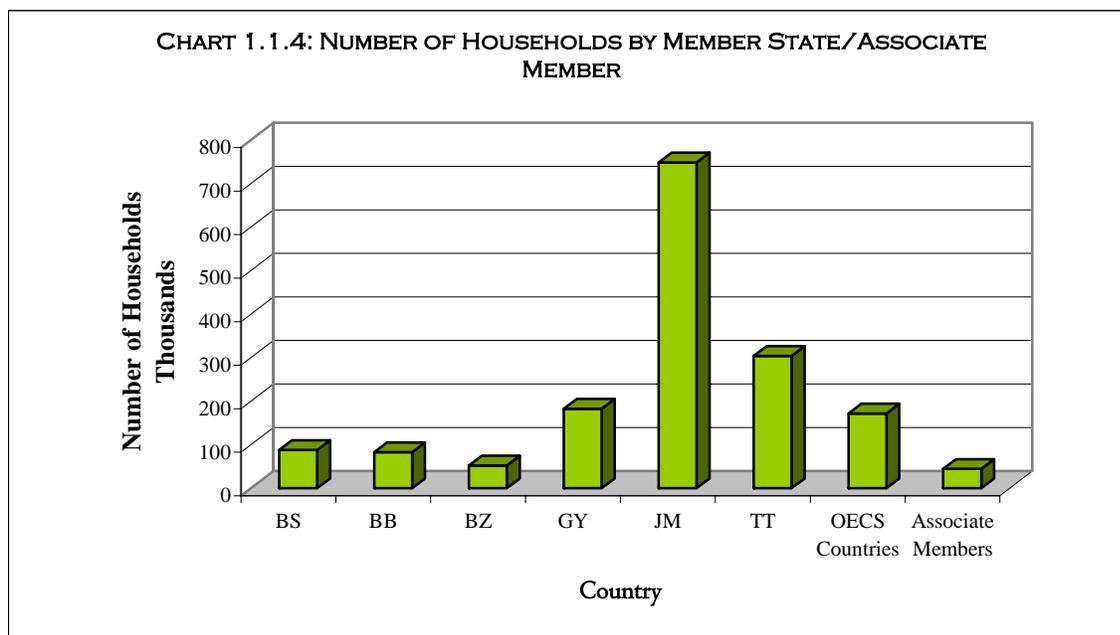


Note: Other includes Townhouse, Combined Business & Dwelling, Barracks, Not Stated and Other.



Note: Associate Members include Anguilla, Bermuda, The British Virgin Islands and The Turks and Caicos Islands.

OECS Countries include Antigua and Barbuda, Dominica, Grenada, Montserrat, Saint Lucia and St. Vincent and the Grenadines.



Note: Associate Members include Anguilla, Bermuda, The British Virgin Islands and The Turks and Caicos Islands.

OECS Countries include Antigua and Barbuda, Dominica, Grenada, Montserrat, Saint Lucia and St. Vincent and the Grenadines.

PH2: MDG 8: ENSURE ENVIRONMENTAL SUSTAINABILITY**Number of Households by Type of tenure****Proportion of households with access to secure tenure****PH****Target 11: By 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers****Concept and Definition**

The concept of household by type of tenure refers to the arrangements under which the household occupies all or part of a housing unit. The classification of households by type of tenure

is as follows:

1. Ownership of a housing unit
2. Renting all or a part of housing unit
3. Other arrangements:
 - 3.1 Squatted
 - 3.2 Leased
 - 3.3 Rent-Free
 - 3.4 Other

(Please refer to the United Nations Principles and Recommendations for Population and Housing Censuses, Revision 1 (1997).)

Secure tenure refers to households that own or are purchasing their homes, are renting privately or are in social housing or subtenancy. Households without secure tenure are defined as squatters (whether or not they pay rent), homeless and households with no formal agreement.

A slum household is defined by UN-HABITAT as a group of individuals living under the same roof that lack one or more (in some cities, two or more) of the following conditions: security of tenure, structural quality and durability of dwellings, access to safe water, access to sanitation facilities and sufficient living area.

(Please refer to The United Nations Indicators for Monitoring the Millennium Development Goals--Definitions, Rationale, Concepts and Sources (2003).)

Types of Tenure:

Owned: This category applies to heads of households who possess legal title to the dwelling or are in the process of buying the dwelling.

Rented-Private/Government: This applies when the head of the household or any other member rents the dwelling from an individual, company, Government or Government Agency. Rental, although it may be covered by a contract, conveys the idea of payments being made monthly.

Squatted: This applies when households are found occupying an area without permission or without being the owner of any legal rights to the dwelling.

Leased: A lease differs from a rental by an agreed contract, which stipulates payment, in advance, of the total rent for the dwelling during the entire duration of the contract.

Rent-Free: Here, no member of the household pays rent for the occupancy of the dwelling.

Other: This applies when households are occupying the dwelling under conditions different from those specified above.

Method of Computation

The number of households by type of tenure is classified according to data reported for the 2000 Round of Census categories Owned, Squatted, Rent, Leased, Rent-Free and Other, which have been defined in the foregoing section.

Indicator Relevance

The indicator is intended to provide an overview of the share of urban population living in conditions of poverty and physical and environmental deprivation. Under international human rights law, secure tenure is one of the seven components of the human right to adequate housing, which is linked to the right to land. Insecure tenure reinforces poverty and social exclusion. Slums areas have the highest concentrations of poor people and the worst shelter and physical environmental conditions. Slum dwellers are also more likely to contract water-borne diseases, such as cholera and typhoid, as well as opportunistic ones that accompany HIV/AIDS.¹

Data Assessment

As discussed for indicator PH1, the concept of a household is harmonized both within the Region and with international definition. Of the seventeen countries that provided data for this indicator, only five provided the definition that was used for the concept of tenure. It was, therefore, assumed that all other countries adhered to the internationally recommended definition for tenure. The five countries that provided type of tenure definitions were Dominica, Jamaica, St. Kitts and Nevis, Suriname and Trinidad and Tobago. Dominica, Jamaica, St. Kitts and Nevis and Trinidad and Tobago followed the internationally recommended definition of type of tenure. In addition, Dominica and St. Kitts and Nevis also specified that the arrangements under which the household occupies all or part of a housing unit must be of a legal and financial nature. Suriname, on the other hand, defined type of tenure as the right to exclusive occupancy, and not as the arrangements under which occupancy occurs. Dominica, Jamaica and St. Kitts and Nevis stated that occupancy should be in living quarters. Suriname and Trinidad and Tobago specified that occupancy should be in a dwelling. This indicator is therefore, partially harmonized within the Region.

¹ United Nations Human Settlements Programme (UN-Habitat) The Challenge of Slums: Global Report on Human Settlements 2003

Data Sources

Please refer to **Appendix 2.1.2 (a)** for the sources of the data on Households by type of tenure for Member States and Associate Members.

Evaluation

The data presented in **Tables 1.2 (a)** and **(b)** show that 63.3 per cent of households in the Region *owned* their homes and 21.8 per cent of households *rented*. The proportion of households in Member States that *owned* their homes was 63.3 per cent compared with 42.4 per cent of households in Associated Member States.

Grenada had the largest proportion of households with *Owned* dwelling (81.8 per cent) followed by Trinidad and Tobago and St Vincent and the Grenadines (75.8 per cent and 75.7 per cent respectively). The proportion of households in Member States which *rented* from *Private/Government* were more in Montserrat (44.9 per cent) followed by The Bahamas (36.5 per cent) and Antigua and Barbuda (32.8 per cent). 12.1 per cent of households in Member States lived in *Rent-Free* dwelling and Guyana (17.4 per cent) followed by Jamaica (15.8 per cent) and Belize (12.2 per cent) reported the highest proportions of households.

The proportion of people living in households that *owned* their accommodation in Associate Members was 42.4 per cent overall and 67.1 per cent for Anguilla, 43.2 per cent for Bermuda, 35.1 per cent for The British Virgin Islands, and 35.6 per cent for The Turks and Caicos Islands. The British Virgin Islands (58.2 per cent) reported the highest proportion of households *renting private or government* housing followed by The Turks and Caicos Islands (57.6 per cent), Bermuda (51.1 per cent) and Anguilla (30 per cent) with an overall average of 51.7 per cent among Associate Members.

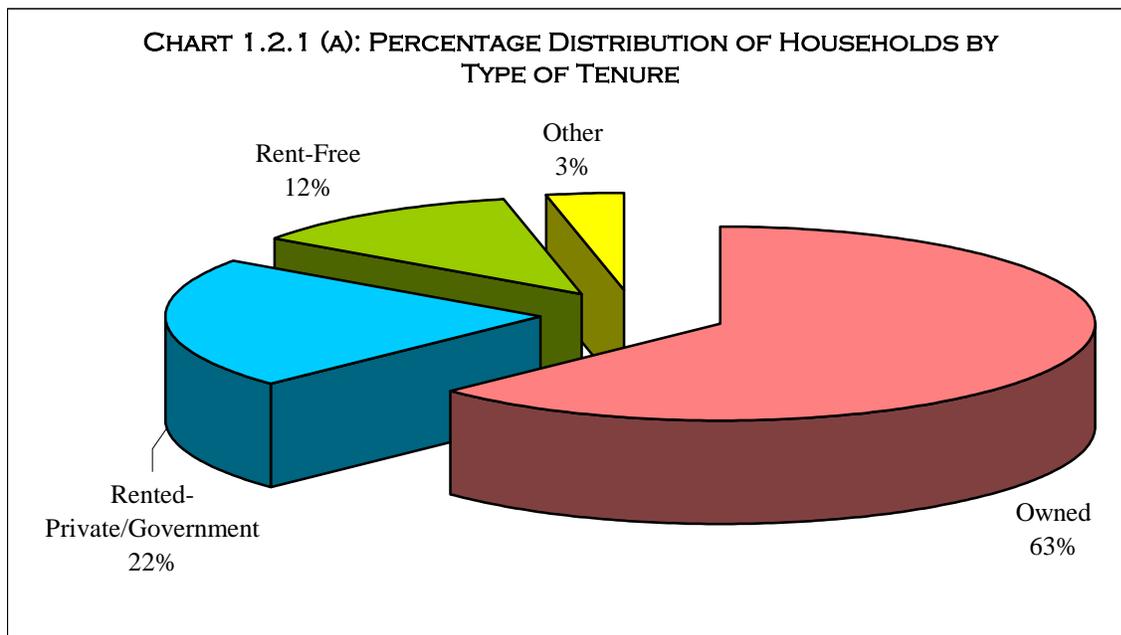
During the 2000 Round of Census *squatting* accounted for 0.4 per cent of households in the Region with Guyana reporting the highest proportion in the Region, 2.3 per cent.

Table 1.2 (a) Number of Households by Type of Tenure: 2000 Round of Census

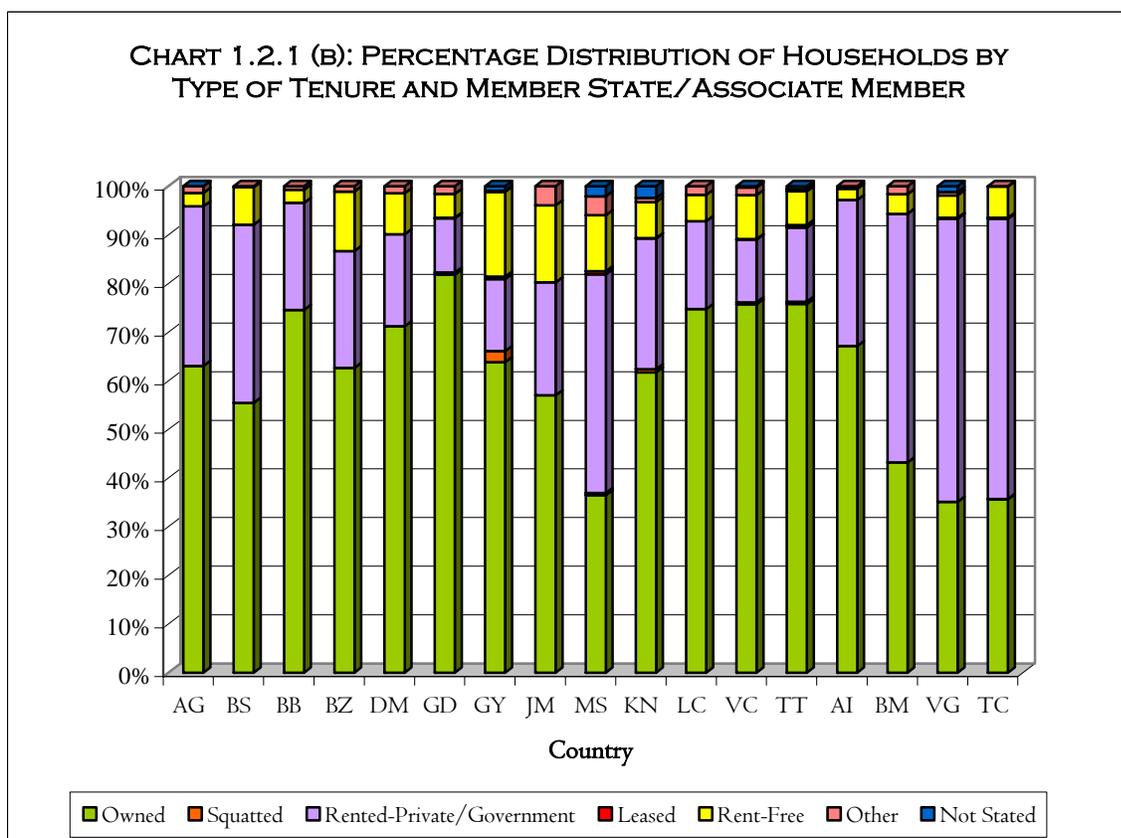
Country	Year	Owned	Squatted	Rented-Private/ Government	Leased	Rent-Free	Other	Not Stated	Total all Households
AG	2001	12,895		6,707		562	286		20,450
BS	2000	48,660		32,126		6,738	218		87,742
BB	2000	61,904		18,286		2,203	633		83,026
BZ	2000	32,519		12,490		6,353	583		51,945
DM	2001	15,918		4,232		1,880	329		22,359
GD	2001	27,383	142	3,737	42	1,630	543		33,477
GY	2002	116,497	4,218	26,977	965	31,797	386	1,769	182,609
JM	2001	426,445		173,860		118,454	29,567		748,326
MS	2001	849	11	1,046	16	268	90	49	2,329
KN	2001	9,677	101	4,215	13	1,161	129	384	15,680
LC	2001	35,202		8,529		2,545	848		47,124
VC	2001	22,906	131	3,899	27	2,733	482	84	30,262
TT	2000	230,291	1,454	46,145	1,752	20,994	1,391	1,844	303,871
TOTAL MEMBER STATES		1,041,146	6,057	342,249	2,815	197,318	35,485	4,130	1,629,200
ASSOCIATE MEMBERS									
AI	2001	2,504	...	1,120	...	85	21	...	3,730
BM	2000	10,863	...	12,854	...	1,006	425	...	25,148
VG	2001	2,944	2	4,879	15	386	57	103	8,386
TC	2001	2,583	7	4,178	13	464	9	...	7,254
TOTAL ASSOCIATE MEMBERS		18,894	9	23,031	28	1,941	512	103	44,518
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		1,060,040	6,066	365,280	2,843	199,259	35,997	4,233	1,673,718

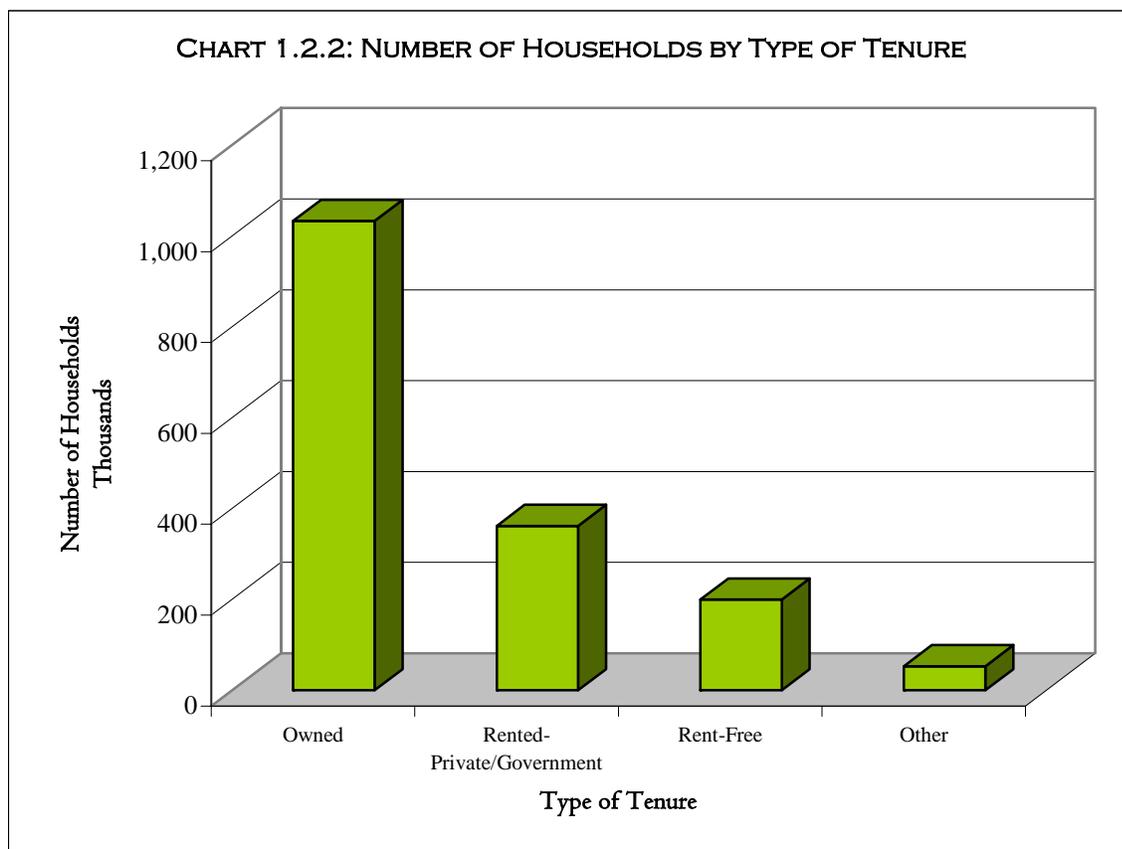
Table 1.2 (b) Percentage Distribution of Households by Type of Tenure: 2000 Round of Census

Country	Year	Owned	Squatted	Rented-Private/ Government	Leased	Rent-Free	Other	Not Stated	Total all Households
AG	2001	63.1		32.8		2.7	1.4		100.0
BS	2000	55.5		36.6		7.7	0.2		100.0
BB	2000	74.6		22.0		2.7	0.8		100.0
BZ	2000	62.6		24.0		12.2	1.1		100.0
DM	2001	71.2		18.9		8.4	1.5		100.0
GD	2001	81.8	0.4	11.2	0.1	4.9	1.6		100.0
GY	2002	63.8	2.3	14.8	0.5	17.4	0.2	1.0	100.0
JM	2001	57.0		23.2		15.8	4.0		100.0
MS	2001	36.5	0.5	44.9	0.7	11.5	3.9	2.1	100.0
KN	2001	61.7	0.6	26.9	0.1	7.4	0.8	2.4	100.0
LC	2001	74.7		18.1		5.4	1.8		100.0
VC	2001	75.7	0.4	12.9	0.1	9.0	1.6	0.3	100.0
TT	2000	75.8	0.5	15.2	0.6	6.9	0.5	0.6	100.0
TOTAL MEMBER STATES		63.9	0.4	21.0	0.2	12.1	2.2	0.3	100.0
ASSOCIATE MEMBERS									
AI	2001	67.1	...	30.0	...	2.3	0.6	...	100.0
BM	2000	43.2	...	51.1	...	4.0	1.7	...	100.0
VG	2001	35.1	0.0	58.2	0.2	4.6	0.7	1.2	100.0
TC	2001	35.6	0.1	57.6	0.2	6.4	0.1	...	100.0
TOTAL ASSOCIATE MEMBERS		42.4	0.0	51.7	0.1	4.4	1.2	0.2	100.0
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		63.3	0.4	21.8	0.2	11.9	2.2	0.3	100.0



Note: Other includes Squatted, Leased, Other and Not Stated.





Note: Other includes Squatted, Leased, Other and Not Stated.

PH3: NUMBER OF HOUSEHOLDS BY TYPE OF MATERIALS OF OUTER WALLS

PH

Concept and Definition

The number of households by type of materials of outer walls refers to the construction material of external (outer) walls of the building in which the sets of living quarters are located. If the walls are constructed of more than one type of material, the predominant type of material should be reported. The types distinguished (brick, concrete, wood, adobe and so on) will depend upon the materials most frequently used in the country concerned and on their significance from the point of view of permanency of construction or assessment of durability. (*Please refer to the United Nations' Principles and Recommendations for Population and Housing Censuses, Revision 1 (1998)*)

Types of Materials of Outer Walls:

Wood: This is applicable where the walls are made solely of wood.

Concrete: This is applicable where the walls are made solely of concrete.

Wood & Concrete: This category includes walls that are made of both wood and concrete blocks or wood and reinforced concrete.

Stone: This applies to buildings where the walls are made of stone.

Brick/Concrete Block: This applies to buildings where the walls are made of hollow clay blocks or concrete bricks, whether plastered or unplastered.

Adobe is unburnt sun-dried bricks or the clay from which such bricks are made.

Wood/Concrete Block/Galvanize Stucco: This applies where the walls are made of wood, galvanize and concrete blocks.

Makeshift includes any material that is not normally used for housing e.g. galvanize, cardboard, etc. Some persons may use an old car/truck, for example, to provide shelter or live under a bridge or other unconventional dwelling structure.

Other: This includes types of material of construction of outer walls not previously described.

Method of Computation

The number of households by type of materials of outer walls is classified from data from the 2000 Round of Census according to the categories Wood, Concrete, Wood & Concrete, Stone, Brick, Adobe, Make-shift and Other, which have been defined in the foregoing section.

Indicator Relevance

In some countries, the material used for the construction of roofs or of floors may be of special significance for the assessment of durability and, in such cases, it may be necessary to collect information on this as well as on the material of the walls. Durability refers to the period of time for which the structure remains habitable, subject to regular maintenance. Further a house is considered “durable” if it is built on a non-hazardous location and has a structure permanent and adequate enough to protect its inhabitants from the extremes of climatic conditions, such as rain, heat, cold and humidity. (*Please refer to the United Nations Principles and Recommendations for Population and Housing Censuses, Revision 1 (1998) para: 2.305*)

Earthquakes have claimed approximately 8 million lives over the last 2,000 years (Dunbar, Lockridge and others, 1992) and fatality rates are likely to continue to rise with increased population and urbanizations of global settlements especially in developing countries. More than 75% of earthquake-related human casualties are caused by the collapse of buildings or structures (Coburn and Spence, 2002).²

Data Assessment

As discussed for indicator PH1, the concept of a household is harmonized both within the Region and with the international definition. The number of households by type of materials of outer walls was obtained from data submitted by Member States and Associate Members. It is assumed that the data collected is in accordance with the international definition. The indicator is partially harmonized.

Data Sources

Please refer to **Appendix 2.1.3 (a)** for the sources of the data on the populations and households of Member States and Associate Members.

Evaluation

Data on the material used for the outer walls in the Region during the 2000 Round of Census shows that 43.9 per cent or 715,088 of households had outer walls made of *concrete* followed by *wood* and *brick/concrete block* (25.0 per cent or 406,728 and 15.5 per cent or 253,238 respectively). Among Member States, 76 per cent of households in The Bahamas had outer walls made of *concrete* and 15.2 per cent had outer walls made of *wood* followed by St. Vincent and the Grenadines reporting 71.6 per cent of households with outer walls made of *concrete* and 19.2 per cent with outer walls made of *wood* (see **Tables 1.3 (a)** and **1.3 (b)**). Guyana reported the highest proportion of households with outer walls made of *wood* (61.6 per cent or 112,557) while Trinidad and Tobago (67 per cent or 203,505) followed by Barbados (44.3 per cent or 36,819) had the highest proportion of households with outer walls of *brick/concrete block*.

In Associate Member States almost three quarters of households (74.4 per cent) had outer walls made of *concrete* and most common in Anguilla (93.4 per cent) and the British Virgin Islands (82.8 per cent).

² Creating a Global Building Inventory for Earthquake Loss Assessment and Risk Management By K Jaiswal and David J. Wald

Table 1.3 (a) Number of Households by Type of Materials of Outer Walls: 2000 Round of Census

Country	Year	Wood	Concrete	Wood & Concrete	Stone	Brick/ Concrete block
AG	2001	9,023	6,747	4,434	37	25
BS	2000	13,375	66,710	2,537	1,772	65
BB	2000	22,358	1,554	1,797	1,518	36,819
BZ	2000	22,923	20,924	2,231	...	29
DM	2001	8,026	10,754	3,300	29	19
GD	2001	13,762	13,696	5,851	22	36
GY	2002	112,557	27,067	34,666	510	761
JM	2001	140,309	515,013	56,764	5,431	11,815
MS	2001	591	1,286	217	0	3
KN	2001	2,890	10,349	2,134	53	3
LC	2001	18,802	19,321	8,247	47	141
VC	2001	5,820	21,667	2,318	94	17
TT	2000	36,292		54,936		203,505
TOTAL MEMBER STATES		406,728	715,088	179,432	9,513	253,238
ASSOCIATE MEMBERS						
AI	2001	101	3,482	98	20	
VG	2001	732	6,947	509	12	5
TC	2001	1,909	3,990	819	68	
TOTAL ASSOCIATE MEMBERS		2,742	14,419	1,426	100	5
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		409,470	729,507	180,858	9,613	253,243

Table 1.3 (a) Cont'd. Number of Households by Type of Materials of Outer Walls: 2000 Round of Census

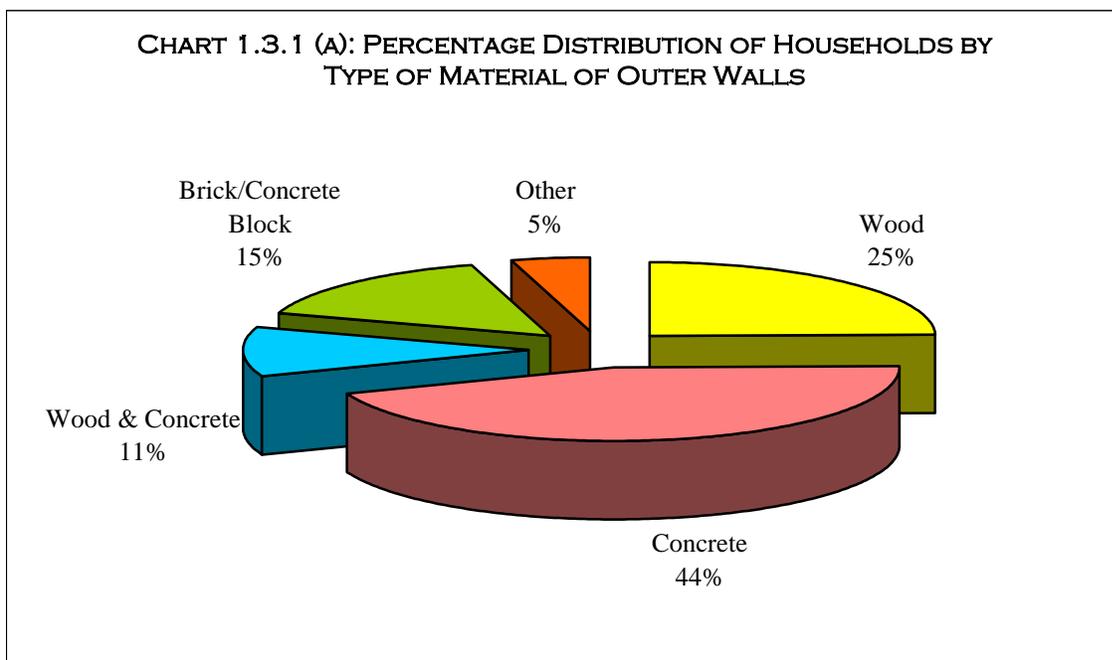
Country	Year	Adobe	Wood/ Concrete block/ Galvanize/ Stucco	Make-shift	Other	Not stated/ Don't Know	Total all Households
AG	2001				184		20,450
BS	2000	2,952	...	...	331		87,742
BB	2000		18,842	...	138		83,026
BZ	2000	...		33	5,805		51,945
DM	2001	1		185	45		22,359
GD	2001	0		110			33,477
GY	2002	3,325		51	3,477	195	182,609
JM	2001	2,823	4,102		12,069		748,326
MS	2001	0		1	228	3	2,329
KN	2001			75	176		15,680
LC	2001	94		0	472		47,124
VC	2001	91		205	50		30,262
TT	2000	1,279	6,013		686	1,160	303,871
TOTAL MEMBER STATES		10,565	28,957	660	23,661	1,358	1,629,200
ASSOCIATE MEMBERS							
AI	2001	...		...	29		3,730
VG	2001	...		36	145		8,386
TC	2001	...	367	8	93		7,254
TOTAL ASSOCIATE MEMBERS		0	367	44	267	0	19,370
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		10,565	29,324	704	23,928	1,358	1,648,570

**Table 1.3 (b) Percentage Distribution of Households by Type of Materials of Outer Walls:
2000 Round of Census**

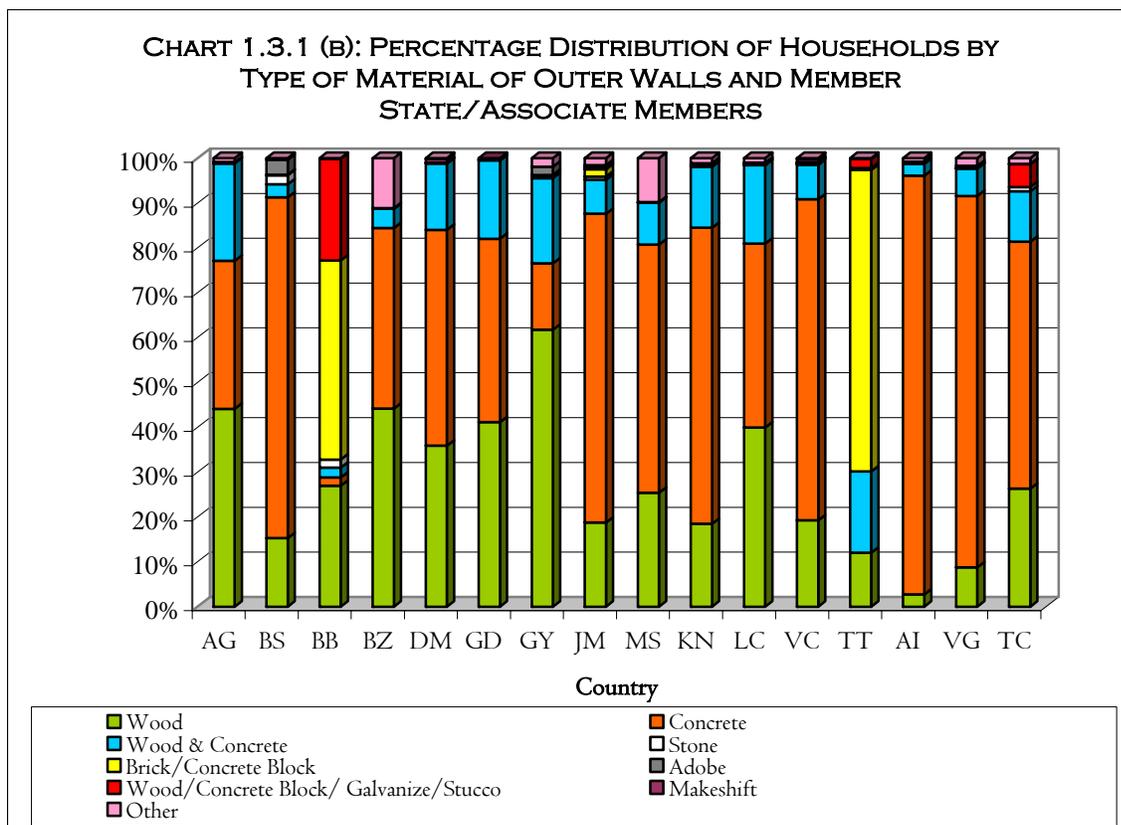
Country	Year	Wood	Concrete	Wood & Concrete	Stone	Brick/ Concrete block
AG	2001	44.1	33.0	21.7	0.2	0.1
BS	2000	15.2	76.0	2.9	2.0	0.1
BB	2000	26.9	1.9	2.2	1.8	44.3
BZ	2000	44.1	40.3	4.3	...	0.1
DM	2001	35.9	48.1	14.8	0.1	0.1
GD	2001	41.1	40.9	17.5	0.1	0.1
GY	2002	61.6	14.8	19.0	0.3	0.4
JM	2001	18.7	68.8	7.6	0.7	1.6
MS	2001	25.4	55.2	9.3	0.0	0.1
KN	2001	18.4	66.0	13.6	0.3	0.0
LC	2001	39.9	41.0	17.5	0.1	0.3
VC	2001	19.2	71.6	7.7	0.3	0.1
TT	2000	11.9		18.1		67.0
TOTAL MEMBER STATES		25.0	43.9	11.0	0.6	15.5
ASSOCIATE MEMBERS						
AI	2001	2.7	93.4	2.6	0.5	
VG	2001	8.7	82.8	6.1	0.1	0.1
TC	2001	26.3	55.0	11.3	0.9	
TOTAL ASSOCIATE MEMBERS		14.2	74.4	7.4	0.5	0.0
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		24.8	44.3	11.0	0.6	15.4

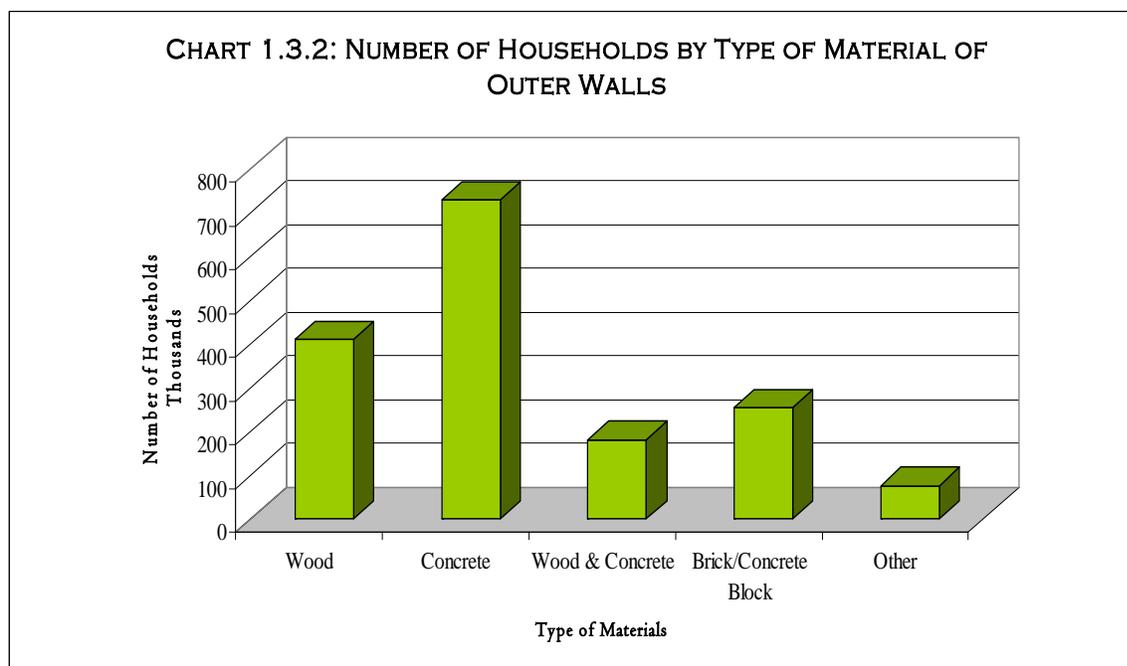
**Table 1.3 (b) Cont'd. Percentage Distribution of Households by Type of Materials of Outer Walls:
2000 Round of Census**

Country	Year	Adobe	Wood/ Concrete block/ Galvanize/ Stucco	Make-shift	Other	Not stated/ Don't Know	Total all Households
AG	2001				0.9		100.0
BS	2000	3.4	...	...	0.4		100.0
BB	2000		22.7	...	0.2		100.0
BZ	2000	...		0.1	11.2		100.0
DM	2001	0.0		0.8	0.2		100.0
GD	2001	0.0		0.3			100.0
GY	2002	1.8		0.0	1.9	0.1	100.0
JM	2001	0.4	0.5		1.6		100.0
MS	2001	0.0		0.0	9.8	0.1	100.0
KN	2001			0.5	1.1		100.0
LC	2001	0.2		0.0	1.0		100.0
VC	2001	0.3		0.7	0.2		100.0
TT	2000	0.4	2.0		0.2	0.4	100.0
TOTAL MEMBER STATES		0.6	1.8	0.0	1.5	0.1	100.0
ASSOCIATE MEMBERS							
AI	2001	...		...	0.8		100.0
VG	2001	...		0.4	1.7		100.0
TC	2001	...	5.1	0.1	1.3		100.0
TOTAL ASSOCIATE MEMBERS		0.0	1.9	0.2	1.4	0.0	100.0
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		0.6	1.8	0.0	1.5	0.1	100.0



Note: Other includes Stone, Adobe, Wood/Concrete Block/ Galvanize/Stucco, Makeshift, Other and Not Stated/Don't Know.





Note: Other includes Stone, Adobe, Wood/Concrete Block/ Galvanize/Stucco, Makeshift, Other and Not Stated/Don't Know.

PH4: NUMBER OF HOUSEHOLDS BY TYPE OF MATERIAL USED FOR ROOFING

PH

Concept and Definition

The type of material used for roofing refers to the construction material of the roof. Only the predominant material of the roof is enumerated.

Types of Material Used for Roofing:

Sheet metal: Zinc, aluminium galvanize or galvanize

Shingle: Asphalt

Shingle: Wood

Shingle – other: This includes fibreglass or any other type of shingle.

Tile: Concrete, clay and other tiles. This category includes “decramastic” and similar types of roofing tiles.

Concrete: Usually referred to as concrete slab.

Makeshift/Thatched: This includes any unconventional material used such as cardboard, the roofs of cars, etc.

Other: Any other material used not mentioned above.

Method of Computation

The number of households by type of material used for roofing is classified from data from the 2000 Round of Census according to the categories Sheet-Metal, Shingle-Asphalt, Shingle-Wood, Shingle-Other, Tile, Concrete, Make-shift, Thatched and Other, which have been defined in the foregoing section.

Indicator Relevance

One of the ways of ascertaining the improvements in the quality of housing structures where people live is by analyzing the material of the roof, wall and floor: the three main components of any house. Data on the construction material of the roof also provides information of the construction and replacement of housing units.

The number of households by type of material used for roofing also determines how many of the households are housed in structurally acceptable housing units. Structural acceptability of housing units implies that these are made of durable construction materials that will safeguard the household occupants from adverse climatic effects and provide protection and privacy. (Please refer to the Philippines' National Statistics Office website at <http://www.census.gov.ph/data/technotes/notecph00.html>.)

Data Assessment

As discussed for indicator PH1, the concept of a household is harmonized both within the Region and with international the definition.

The number of households by type of material used for roofing was obtained from data submitted by Member States and Associate Members. However, the Member States and Associate Members did not provide the definitions that were used to gather the data for this indicator. The indicator is partially harmonized.

Data Sources

Please refer to **Appendix 2.1.4 (a)** for the sources of the data on the populations and households of Member States and Associate Members.

Evaluation

The commonly used types of roofing materials for households in the CARICOM Region were *sheet metal (zinc)* (81.5 per cent) followed by *concrete* (11.7 per cent). The proportion of households with roofs made of *sheet metal (zinc)* was higher in Member States (82.3 per cent) than in Associate Member States (33.7 per cent) with the latter reporting more houses with roofs made of *concrete* (34.5 per cent) and *asphalt shingle* (20.8 per cent).

Data in **Tables 1.4 (a)** and **(b)** show that the highest proportions of households with roofs made of *sheet metal (zinc)* were found in Grenada (96.4 per cent) followed by Saint Lucia (93.7 per cent) while Anguilla had the lowest proportion of households with roofs made of *sheet metal (zinc)* (19.2 per cent). Among Associate Members, *concrete* (34.5 per cent) closely followed by *sheet metal (zinc)* (33.7 per cent) were the most commonly used types of roofing materials. 75.2 per cent of total households in Anguilla had this type of roofing. The remaining Associate Members, The British Virgin Islands and Turks and Caicos Islands recorded percentages of 42.9 per cent and 3.9 per cent respectively.

In the CARICOM Region, the proportion of households reporting *makeshift, tile* and *thatched* roofs was low, recording 0.2 per cent, 0.5 per cent and 0.6 per cent respectively.

Table 1.4 (a) Number of Households by Type of Material used for Roofing: 2000 Round of Census

Country	Year	Sheet metal (Zinc)	Shingle-Asphalt	Shingle - Wood	Shingle - other	Tile	Concrete	Make-shift	Thatched	Other	Not stated	Total all Households
AG	2001	18,849	826	124	75	108	232	...		236		20,450
BB	2000	73,539	4,997	464	...	1,124	1,121	...		1,781		83,026
BZ	2000	41,617	...	...	204	...	4,297	...		5,827		51,945
DM	2001	20,097	554	84	40	25	1,468	10		81		22,359
GD	2001	32,278	578	116	85	135	235	12		38		33,477
GY	2002	164,873	1,104	1,755	1,839	1,953	325	2,522	7,014	1,199	25	182,609
JM	2001	583,434	...	10,054	7,902	2,626	128,535	...		15,775		748,326
MS	2001	1,297	594	64	6	0	299	0		63	6	2,329
KN	2001	10,818	3,400	201	40	40	928	14		80	159	15,680
LC	2001	44,155	1,272	188	47	47	895	47		473		47,124
VC	2001	27,175	975	150	67	69	1,550	31		192	53	30,262
TOTAL MEMBER STATES		1,018,132	14,300	13,200	10,305	6,127	139,885	2,636	7,014	25,745	243	1,237,587
ASSOCIATE MEMBERS												
AI	2001	716	25	...	63	10	2,806	8		70	32	3,730
VG	2001	3,928	182	319	23	53	3,600	1		258	22	8,386
TC	2001	1,875	3,830	740	282	198	284	45		0		7,254
TOTAL ASSOCIATE MEMBERS		6,519	4,037	1,059	368	261	6,690	54		328	54	19,370
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		1,024,651	18,337	14,259	10,673	6,388	146,575	2,690	7,014	26,073	297	1,256,957

**Table 1.4 (b) Percentage Distribution of Households by Type of Material used for Roofing:
2000 Round of Census**

Country	Year	Sheet metal (Zinc)	Shingle-Asphalt	Shingle - Wood	Shingle - other	Tile	Concrete	Make-shift	Thatched	Other	Not stated	Total all Households
AG	2001	92.2	4.0	0.6	0.4	0.5	1.1	...		1.2		100.0
BB	2000	88.6	6.0	0.6	...	1.4	1.4	...		2.1		100.0
BZ	2000	80.1	...	...	0.4	...	8.3	...		11.2		100.0
DM	2001	89.9	2.5	0.4	0.2	0.1	6.6	0.0		0.4		100.0
GD	2001	96.4	1.7	0.3	0.3	0.4	0.7	0.0		0.1		100.0
GY	2002	90.3	0.6	1.0	1.0	1.1	0.2	1.4	3.8	0.7	0.0	100.0
JM	2001	78.0	...	1.3	1.1	0.4	17.2	...		2.1		100.0
MS	2001	55.7	25.5	2.7	0.3	0.0	12.8	0.0		2.7	0.3	100.0
KN	2001	69.0	21.7	1.3	0.3	0.3	5.9	0.1		0.5	1.0	100.0
LC	2001	93.7	2.7	0.4	0.1	0.1	1.9	0.1		1.0		100.0
VC	2001	89.8	3.2	0.5	0.2	0.2	5.1	0.1		0.6	0.2	100.0
TOTAL MEMBER STATES		82.3	1.2	1.1	0.8	0.5	11.3	0.2	0.6	2.1	0.0	100.0
ASSOCIATE MEMBERS												
AI	2001	19.2	0.7	...	1.7	0.3	75.2	0.2		1.9	0.9	100.0
VG	2001	46.8	2.2	3.8	0.3	0.6	42.9	0.0		3.1	0.3	100.0
TC	2001	25.8	52.8	10.2	3.9	2.7	3.9	0.6		0.0		100.0
TOTAL ASSOCIATE MEMBERS		33.7	20.8	5.5	1.9	1.3	34.5	0.3		1.7	0.3	100.0
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		81.5	1.5	1.1	0.8	0.5	11.7	0.2	0.6	2.1	0.0	100.0

CHART 1.4.1 (A): PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY TYPE OF MATERIAL USED FOR ROOFING

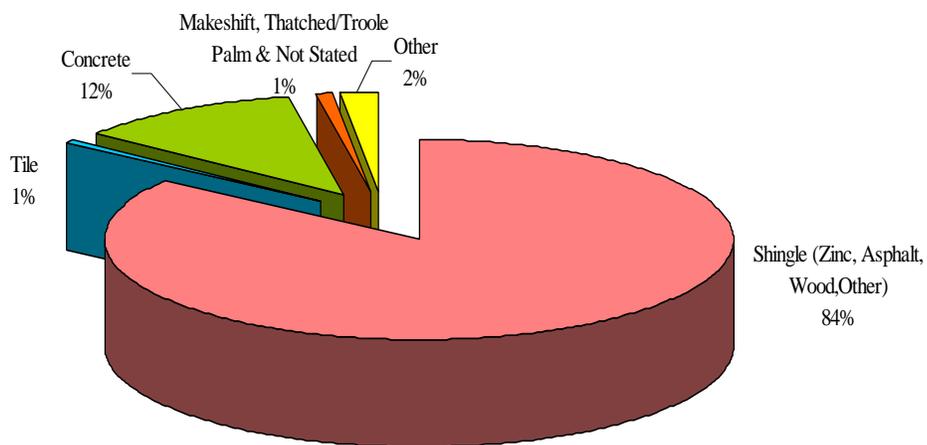
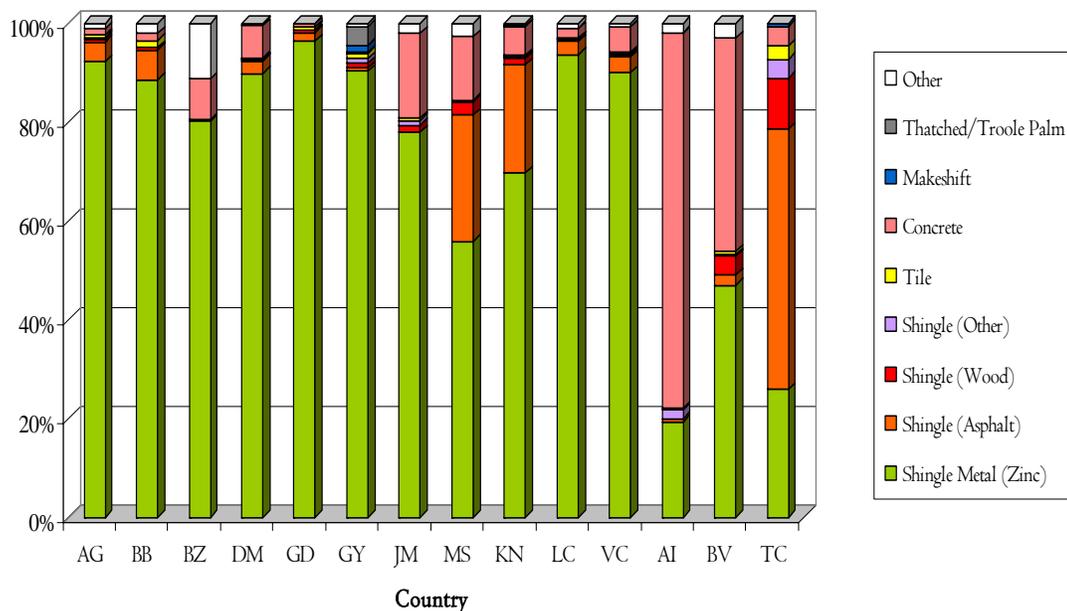
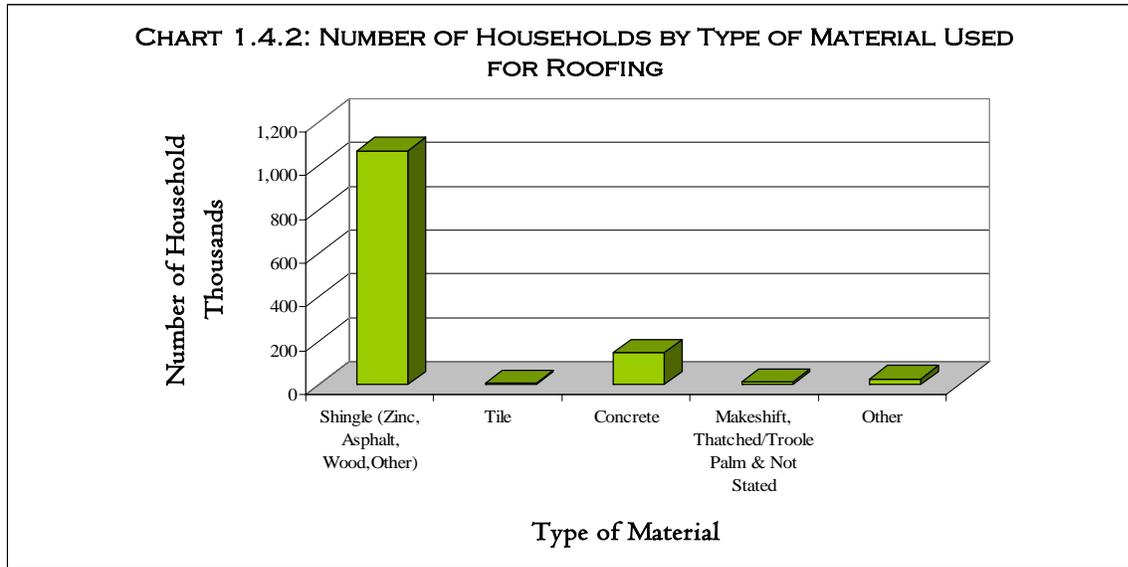


CHART 1.4.1 (B): PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY MATERIALS USED FOR ROOFING AND MEMBER STATE/ASSOCIATE MEMBER





PH5: HOUSEHOLDS BY NUMBER OF BEDROOMS**PH****Concept and Definitions**

A bedroom is defined as a room equipped with a bed and used for night rest. A room is defined as a space in a housing unit or other living quarters enclosed by walls reaching from the floor to the ceiling or roof covering, or to a height of at least two metres, of an area large enough to hold a bed for an adult, that is, at least four square metres. (*Please refer to the United Nations Principles and Recommendations for Population and Housing Censuses, Revision 1 (1998) paras. 2.375 and 2.423.*)

Household by number of bedrooms is the number of permanent sleeping quarters that one or more persons who occupy a dwelling (living quarters) has/have.

Average Number of Bedrooms per Household is the ratio of the total number of bedrooms per household to the total number of households.

Average Household Size is the estimated number of persons forming a household. It is the ratio of the total population to the total number of households.

Average number of persons per bedroom refers to the estimated number of persons occupying a bedroom.

Method of Computation

Average Household Size =

$$\frac{\text{Total Population}}{\text{Total Number of Households}}$$

Average Number of Bedrooms per Household =

$$\frac{\text{Total Number of Bedrooms per Household}}{\text{Total Number of Households}}$$

Average Number of Persons per Bedroom =

$$\frac{\text{Average Size of Household}}{\text{Average Number of Bedrooms per Household}}$$

Indicator Relevance

The number of households by number of bedrooms allows density levels to be studied according to the number of bedrooms available in relation to the number of occupants. Density of occupation in terms of the number of persons per room is a widely recognized measure of the adequacy of housing conditions. One of the aims of housing policy is to reduce the density of occupation to a level consistent with the maintenance of health and privacy of the occupants. This aspect of housing is

regarded as being of sufficient importance in many countries for legal standards to have been adopted which specify the maximum number of persons by age, sex and family relationships to be housed in dwellings having a specified number of rooms and bedrooms.

The number of households by number of bedrooms is also a useful indicator for assessing the current housing situation and measuring the need for housing. (*Please refer to the United Nations Principles and Recommendations for Population and Housing Censuses, Revision 1 (1998) para. 2.404 and Principles and Recommendations for the 1970 Housing Censuses (1969)*)

Data Assessment

As discussed for indicator PH1, the concept of a household is harmonized both within the region and in the international realm.

The number of households by number of bedrooms was obtained from data submitted by Member States and Associate Members. It is assumed that the data collected is in accordance with the international definition. The indicator is partially harmonized.

Bermuda reported 25,148 as the total number of households. This total is reflected in all of the indicators but this one: number of households by number of bedrooms, for which the total is reported as 24,763. This difference in the number of households was attributed to the fact that 385 households were omitted from this indicator because they were grouped.

Data Sources

Please refer to **Appendix 2.1.5 (a)** for the sources of the data on the populations and households of Member States and Associate Members.

Evaluation

The majority of households in the Region reported that they lived in a *two-bedroom* unit (32.9 per cent), followed by *one-bedroom* units (25.6 per cent) and *three-bedroom* or larger units (25.4 per cent). Six countries including two Associate Members reported data on the average number of persons per bedroom which was greater than one and averaged 1.5 persons per bedroom for all reporting countries. The average number of persons per bedroom was higher in Saint Lucia (2.0) and Grenada (1.7) as compared with St. Vincent and the Grenadines (1.3) and Bermuda (1.2).

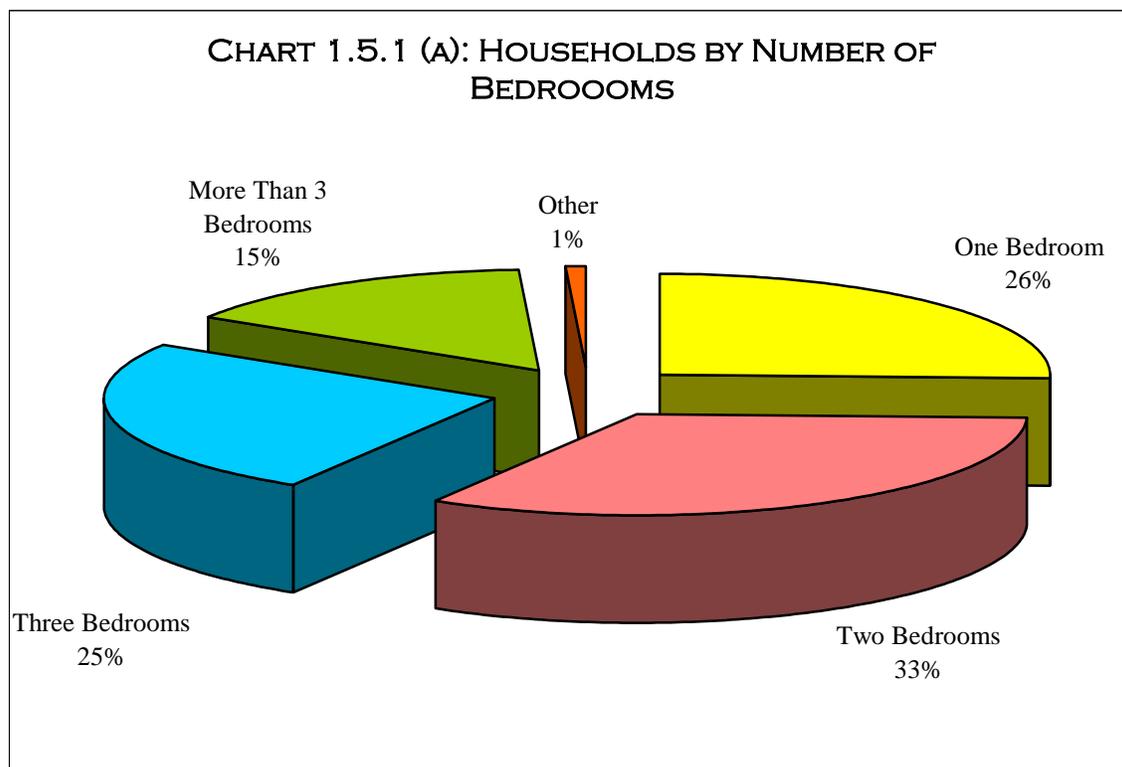
The average size of households for the ten reporting countries ranged from 2.5 persons per household in Bermuda to 3.7 persons per household in Trinidad and Tobago. Of the countries which provided data on number of bedrooms per household, St. Vincent and the Grenadines had the highest (2.7) whereas The Turks and Caicos Islands reported the least number of bedrooms per household (1.9). (See **Tables 1.5 (a) and (b)**).

Table 1.5(a) – Number of Households by Number of Bedrooms: 2000 Round of Census

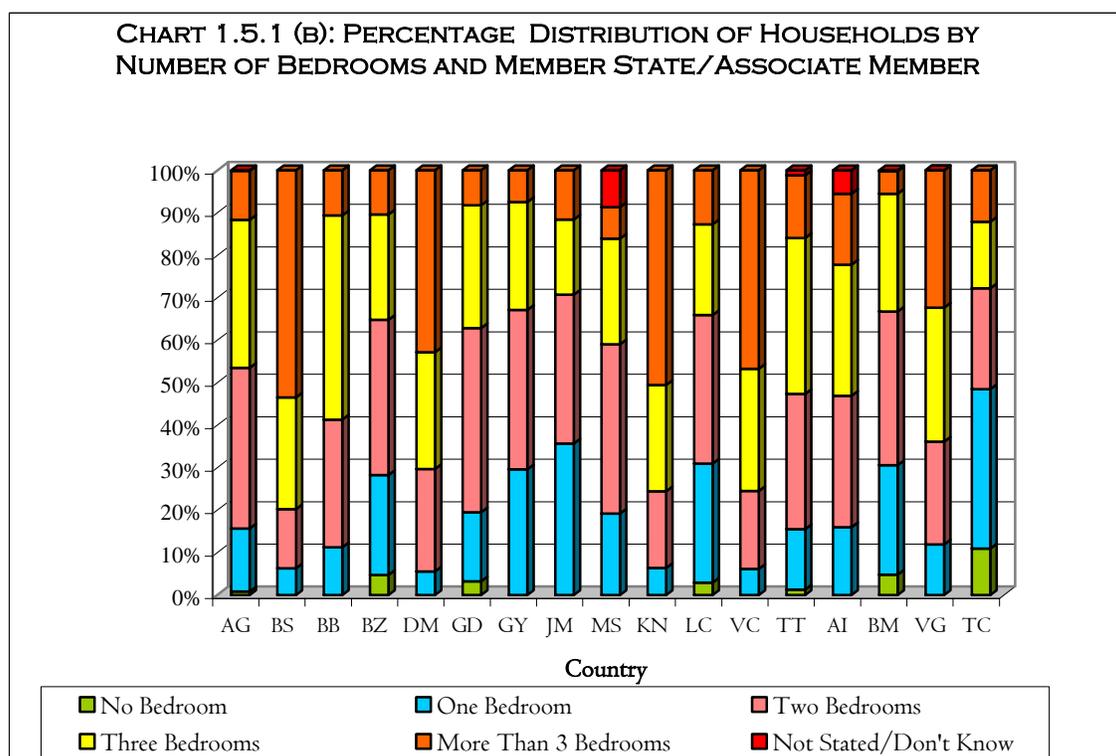
Country	Year	No bedroom	One bedroom	Two bedrooms	Three bedrooms	More than three bedrooms	Not Stated/ Don't Know	Total all households	Average number of bedrooms per household	Average size of the household	Average number of persons per bedroom
AG	2001	163	3,029	7,750	7,121	2,357	30	20,450	...	...	...
BS	2000	...	5,525	12,188	23,109	46,920	...	87,742	...	...	...
BB	2000	...	9,300	24,998	39,929	8,799	...	83,026	...	3.2	...
BZ	2000	2,451	12,223	18,969	12,920	5,382	...	51,945	...	4.5	...
DM	2001	...	1,233	5,396	6,150	9,580	...	22,359	...	3.1	...
GD	2001	1,069	5,448	14,526	9,687	2,747	...	33,477	2.0	3.3	1.7
GY	2002	...	54,033	68,600	46,291	13,685	...	182,609	...	...	...
JM	2001	...	266,843	262,486	132,374	86,623	...	748,326	2.0	3.2	1.5
MS	2001	...	446	929	579	173	202	2,329	...	...	...
KN	2001	...	991	2,831	3,930	7,928	...	15,680	...	...	...
LC	2001	1,367	13,195	16,493	10,085	5,984	...	47,124	2.0	3.0	2.0
VC	2001	...	1,855	5,548	8,718	14,141	...	30,262	3.0	3.5	1.3
TT	2000	3,699	43,447	96,685	111,525	45,009	3,506	303,871	...	3.7	...
TOTAL MEMBER STATES		8,749	417,568	537,399	412,418	249,328	3,738	1,629,200			
ASSOCIATE MEMBERS											
AI	2001	...	594	1,156	1,151	623	206	3,730	...	3.1	...
BM	2000	1,188	6,385	8,964	6,866	1,319	41	24,763	2.0	2.5	1.2
VG	2001	0	997	2,033	2,645	2,711	0	8,386	...	...	...
TC	2001	791	2,724	1,722	1,137	880	...	7,254	1.9	2.7	1.5
TOTAL ASSOCIATE MEMBERS		1,979	10,700	13,875	11,799	5,533	247	44,133			
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		10,728	428,268	551,274	424,217	254,861	3,985	1,673,333			

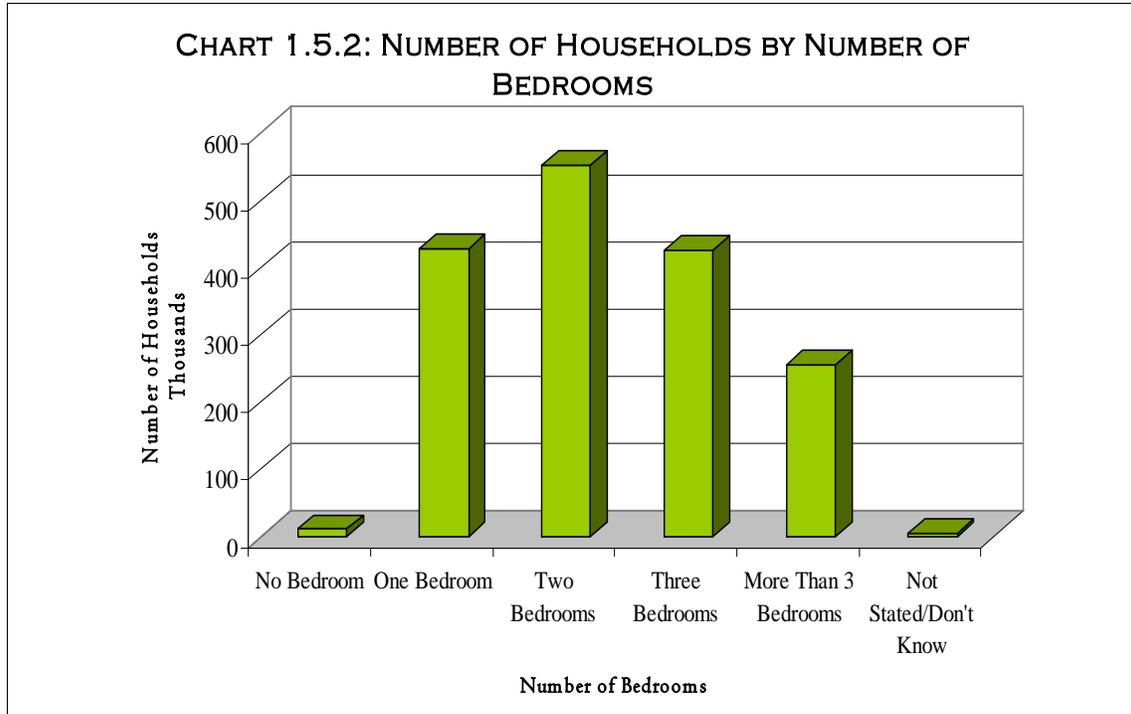
Table 1.5(b) - Percentage distribution of Households by Number of Bedrooms: 2000 Round of Census

Country	Year	No bedroom	One bedroom	Two bedrooms	Three bedrooms	More than three bedrooms	Not Stated/ Don't Know	Total all households	Average number of bedrooms per household	Average size of the household	Average number of persons per bedroom
AG	2001	0.8	14.8	37.9	34.8	11.5	0.1	100.0	...	...	...
BS	2000	...	6.3	13.9	26.3	53.5	...	100.0	...	...	...
BB	2000	...	11.2	30.1	48.1	10.6	...	100.0	...	3.2	...
BZ	2000	4.7	23.5	36.5	24.9	10.4	...	100.0	...	4.5	...
DM	2001	...	5.5	24.1	27.5	42.8	...	100.0	...	3.1	...
GD	2001	3.2	16.3	43.4	28.9	8.2	...	100.0	2.0	3.3	1.7
GY	2002	...	29.6	37.6	25.3	7.5	...	100.0	...	...	...
JM	2001	...	35.7	35.1	17.7	11.6	...	100.0	2.0	3.2	1.5
MS	2001	...	19.1	39.9	24.9	7.4	8.7	100.0	...	...	...
KN	2001	...	6.3	18.1	25.1	50.6	...	100.0	...	...	...
LC	2001	2.9	28.0	35.0	21.4	12.7	...	100.0	2.0	3.0	2.0
VC	2001	...	6.1	18.3	28.8	46.7	...	100.0	3.0	3.5	1.3
TT	2000	1.2	14.3	31.8	36.7	14.8	1.2	100.0	...	3.7	...
TOTAL MEMBER STATES		0.5	25.6	33.0	25.3	15.3	0.2	100.0			
ASSOCIATE MEMBERS											
AI	2001	...	15.9	31.0	30.9	16.7	5.5	100.0	...	3.1	...
BM	2000	4.8	25.8	36.2	27.7	5.3	0.2	100.0	2.0	2.5	1.2
VG	2001	0.0	11.9	24.2	31.5	32.3	0.0	100.0	...	...	...
TC	2001	10.9	37.6	23.7	15.7	12.1	...	100.0	1.9	2.7	1.5
TOTAL ASSOCIATE MEMBERS		4.5	24.2	31.4	26.7	12.5	0.6	100.0			
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		0.6	25.6	32.9	25.4	15.2	0.2	100.0			



Note: Other includes No Bedroom and Not Stated/Don't Know.





Note: Other includes No Bedroom and Not Stated/Don't Know.

PH6: NUMBER OF HOUSEHOLDS BY SIZE OF H HOUSEHOLD

Concept and Definition

In the context of household, size refers to the number of persons residing in private households.

The concept of a household is based on the arrangements made by persons, individually or in groups, for providing themselves with food or other essentials for living. A household may be either (a) a one-person household, that is to say, a person who makes provision for his or her own food or other essentials for living without combining with any other person to form part of a multi-person household or (b) a multi-person household, that is to say, a group of two or more persons living together who make common provision for food or other essentials for living. The persons in the group may pool their incomes and may, to a greater or lesser extent, have a common budget; they may be related or unrelated persons or constitute a combination of persons both related and unrelated. (*Please refer to the United Nations Principles and Recommendations for Population and Housing Censuses, Revision 1 (1998) para: 1.324.*)

Method of Computation

$$\text{Population by Size of Household} = \frac{\text{Total Population}}{\text{Total Number of Households}}$$

The number of households by size of household is classified from data from the 2000 Round of Census according to the categories: One person households, Two person households, Three person households, Four person households and Five or more person households.

Indicator Relevance

Household size affects the pattern of consumption of goods and services which could be shared among household members. For example, in industrialized countries, decreasing household size is one of the factors causing an increase in per capita and aggregate energy use in residential buildings, including lighting, heating and fuel for cooking. Other goods and services which may be affected by household size include water supply, solid waste disposal and household appliances. The number of households by household size, therefore, monitors the number of persons per household which is an important factor that may affect household consumption in the residential sector.

Data Assessment

As discussed for indicator PH1, the concept of a household is harmonized both within the Region and in the international realm. The number of households by size of household was derived from data submitted by Member States and Associate Members. The indicator is harmonized.

Data Sources

Please refer to **Appendix 2.1.6 (a)** for the sources of the data on the Population by Size of Households of Member States and Associate Members.

Evaluation

Table 1.6 (a) and **(b)** below shows that of the 1,696,159 private households in the CARICOM Region, 29.4 per cent contained *five or more persons*. The 335,326 households in the Region with persons living on their own made up 19.8 per cent of the total number of households. *Three-person* households accounted for 17.8 per cent of the total number of households. 16.9 per cent of the total number of households lived in three-person households.

Regionally, the Member State with the highest proportion of one-person households was St Kitts and Nevis at 33.3 per cent. Belize had the lowest proportion of one-person households, 12 per cent, followed by Guyana at 12.3 per cent. Belize also had the highest proportion of households containing *five or more persons* in the Region with 44.1 per cent followed by Guyana (37.3 per cent). Barbados reported the highest proportion of *two-person* households at 23 per cent followed by The Bahamas with 20 per cent.

In contrast to Member States, Associate Member States contained more persons living in one-person households (31.5 per cent) and two-person households (25.8 per cent). The proportion of single person households in The British Virgin Islands (41.7 per cent) was more than the rest of the Associate Members, The Turks and Caicos Islands (29.7 per cent), Bermuda (29.3 per cent), and Anguilla (27.1 per cent). Associate Members had a lower percentage of five or more person households (12.6 percent) as compared to Member States (29.4 per cent) with Anguilla reporting the highest proportion of this size of household (21 per cent).

Table 1.6(a) Number of Households by Size of Household: 2000 Round of Census

Country	Year	Size of household					Total households	Average size of household
		One person	Two person	Three person	Four person	Five or more persons		
BS	2000	18,407	17,543	14,769	13,846	23,177	87,742	...
BB	2000	20,512	19,065	15,375	13,104	14,970	83,026	3.2
BZ	2000	6,219	6,724	7,676	8,411	22,915	51,945	4.5
DM	2001	6,483	4,388	3,398	3,045	5,045	22,359	3.1
GY	2002	22,409	26,491	30,743	34,871	68,095	182,609	...
JM	2001	169,226	136,069	125,221	111,766	206,044	748,326	3.5
MS	2001	744	447	389	334	415	2,329	...
KN	2001	5,214	2,917	2,287	2,039	3,223	15,680	...
VC	2001	7,354	5,027	4,546	4,509	8,855	30,291	...
SR	2004	18,479	20,032	20,429	22,353	42,170	123,463	3.9
TT	2000	46,259	52,478	54,734	59,495	90,905	303,871	3.7
TOTAL MEMBER STATES		321,306	291,181	279,567	273,773	485,814	1,651,641	...
ASSOCIATE MEMBERS								
AI	2001	1,009	792	598	546	785	3,730	3.1
BM	2000	7,358	7,539	4,489	3,683	2,079	25,148	2.5
VG	2001	3,500	1,312	1,121	856	1,597	8,386	...
TC	2001	2,153	1,854	1,281	818	1,148	7,254	2.7
TOTAL ASSOCIATE MEMBERS		14,020	11,497	7,489	5,903	5,609	44,518	...
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		335,326	302,678	287,056	279,676	491,423	1,696,159	...

Table 1.6(b) - Percentage distribution of Households by Size of Household: 2000 Round of Census

Country	Year	Size of household					Total households	Average size of household
		One person	Two person	Three person	Four person	Five or more persons		
BS	2000	21.0	20.0	16.8	15.8	26.4	100	...
BB	2000	24.7	23.0	18.5	15.8	18.0	100	3.2
BZ	2000	12.0	12.9	14.8	16.2	44.1	100	4.5
DM	2001	29.0	19.6	15.2	13.6	22.6	100	3.1
GY	2002	12.3	14.5	16.8	19.1	37.3	100	...
JM	2001	22.6	18.2	16.7	14.9	27.5	100	3.5
MS	2001	31.9	19.2	16.7	14.3	17.8	100	...
KN	2001	33.3	18.6	14.6	13.0	20.6	100	...
VC	2001	24.3	16.6	15.0	14.9	29.2	100	...
SR	2004	15.0	16.2	16.5	18.1	34.2	100	3.9
TT	2000	15.2	17.3	18.0	19.6	29.9	100	3.7
TOTAL MEMBER STATES		19.5	17.6	16.9	16.6	29.4	100	...
ASSOCIATE MEMBERS								
AI	2001	27.1	21.2	16.0	14.6	21.0	100	3.1
BM	2000	29.3	30.0	17.9	14.6	8.3	100	2.5
VG	2001	41.7	15.6	13.4	10.2	19.0	100	...
TC	2001	29.7	25.6	17.7	11.3	15.8	100	2.7
TOTAL ASSOCIATE MEMBERS		31.5	25.8	16.8	13.3	12.6	100	...
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		19.8	17.8	16.9	16.5	29.0	100	...

CHART 1.6.1 (A): PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY SIZE OF HOUSEHOLD

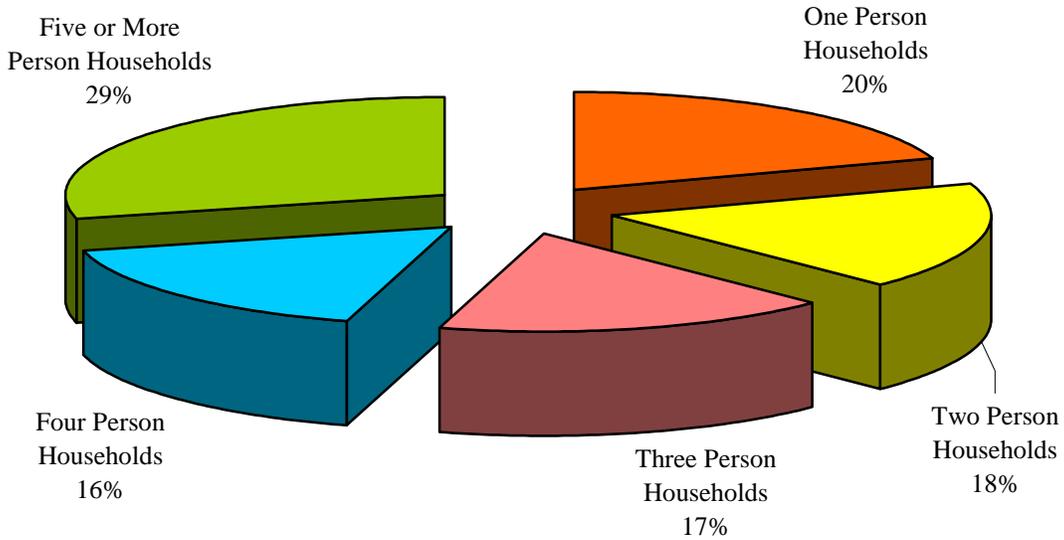
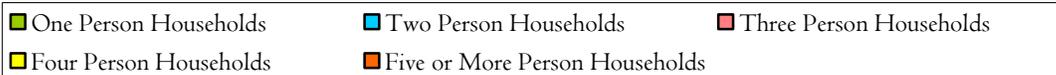
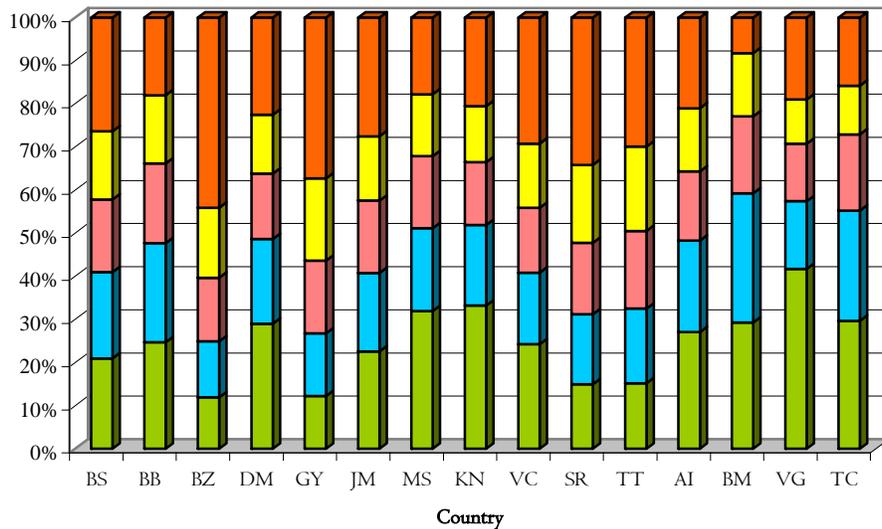
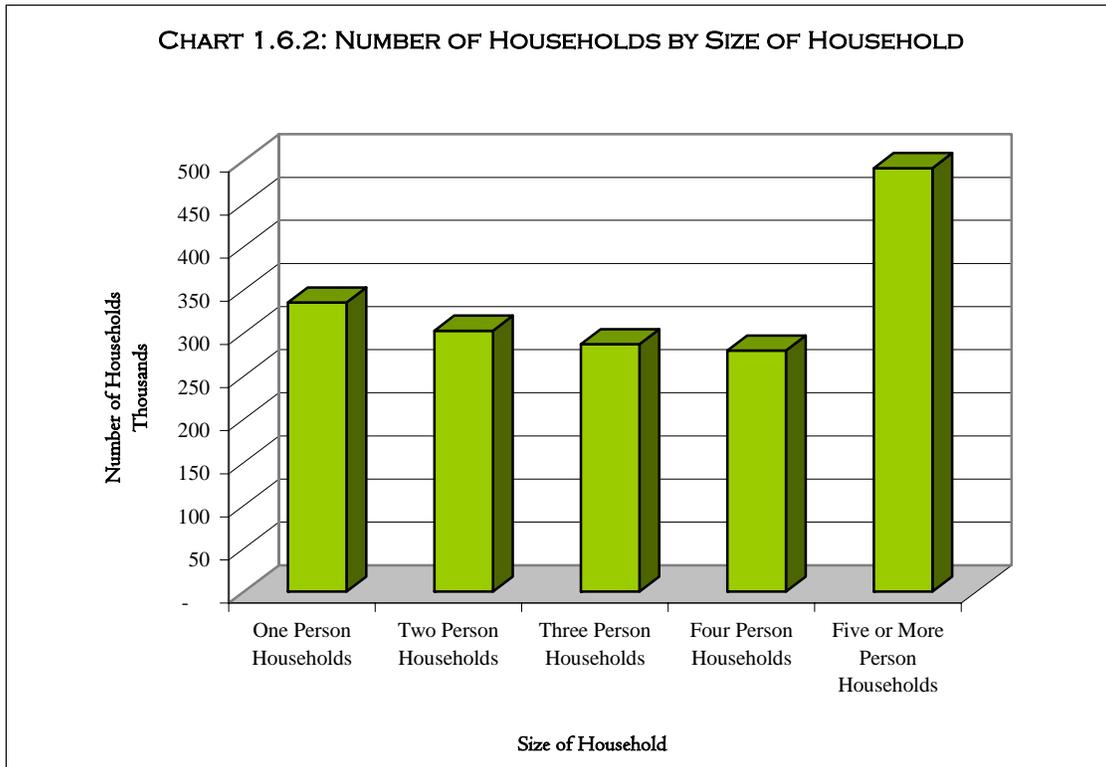


CHART 1.6.1 (B): PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY SIZE OF HOUSEHOLD AND MEMBER STATE/ASSOCIATE MEMBER





Appendix 1.1**Concepts of Dwelling, Tenure and Household by Member State and Associate Member**

Country	Concept of Household	Concept of Dwelling	Concept of Tenure
Anguilla		<ul style="list-style-type: none"> - A residential building can consist of one or more private dwelling units. For example a detached single house is one residential building and one private dwelling unit. - An apartment building is one residential building but many private dwelling units. - A private dwelling unit may be a single house, flat, apartment, outroom, part of a commercial building, hotel or a boarding house catering for less than six persons. 	
Antigua and Barbuda		Any building/edifice/ structure or separate and independent part of a building/edifice/structure wherein resides a person or group of persons—Private Households, at the time of the census enumeration process.	
The Bahamas	The concept of a household for the census applies to a single individual or groups of individuals who occupy the same dwelling. Four types of households were identified for the purpose of enumeration. They comprise any of the following: a person living alone; a family with or without lodgers or servants; a group of unrelated persons living together and occupants of institutions, hotels and other collective dwellings.		

Country	Concept of Household	Concept of Dwelling	Concept of Tenure
Barbados	A household, for the purposes of the Census, consists of a person or group of persons living together in a dwelling unit. Where there are several persons living together as a household, these persons may comprise a single family, but there are also households where the members are not members of one family.	A private dwelling unit is either a separate building or an independent part of a building used or intended to be used for living purposes. The key factors in identifying a dwelling unit are separateness and independent entrances without having to pass through the living quarters of another household.	
Belize		Dwelling units are classified in the 2000 Census as: Undivided Private House, Part of House, Flat, Double House, Business Dwelling, Barracks and Other.	
Bermuda	For purposes of the 2000 Census, a household is a person or group of person living together in a dwelling unit. In most cases, the members of a household are related by family ties but there are three main variations: A servant who sleeps in the same dwelling unit as his/her employed, i.e. does not have separate quarters equipped with cooking and sleeping facilities, etc is included as a member of the employer's household; a boarders or lodger, i.e. a person who sleeps and/or eats in the dwelling and takes meals with the household is considered a member of the household; and a group of unrelated persons living together and sharing one dwelling unit.	A private dwelling unit is a room or group of rooms used, or intended to be used, for living purposes. It must be capable of permanent human habitation and must have: (i) Its own separate access to the street or common landing or staircase, and (ii) Its own cooking, living, sleeping and sanitary facilities which the occupants of the dwelling do not have to share with any persons other than their own household members.	

Country	Concept of Household	Concept of Dwelling	Concept of Tenure
Dominica	<p>A private household consists of one or more persons living together (i.e. sleeping most nights of a week 4 out of 7) and sharing at least one daily meal. It is important to note that a member of a household need not be a relative of the main family. For example, a boarder or domestic servant who sleeps in most nights of the week is a member of the household. It is possible for a household to consist of just one person, or of more than one family, as long as they share living arrangements. A group of unrelated persons living together can also comprise a household.</p>		<p>This relates to the legal and financial arrangements under which the household occupies its living quarters.</p>
Guyana		<p>A dwelling unit is any building or separate and independent part of a building in which a person or group of persons is living at the time of census enumeration. It must have direct access from the street or common landing, staircase, passage or gallery where occupants can enter or leave without passing through anybody else's living quarters. One dwelling unit may have one or more household.</p>	
Jamaica	<p>A household may consist of one person who lives alone or a group of person who, as a unit, jointly occupy the whole or part of a dwelling unit, who have common arrangements for housekeeping, and who</p>	<p>A dwelling is any building or separate part of a building/housing unit in which a person or group of persons lived at the time of the census. It therefore represents the living quarters of those present. The key factors in identifying a dwelling were</p>	<p>Questions on tenure relate to the conditions under which households occupied their living quarters.</p>

Country	Concept of Household	Concept of Dwelling	Concept of Tenure
	generally share at least one meal. The household may be composed of related persons only, of unrelated persons, or of a combination of both.	separateness and independence. Occupiers of a dwelling unit must have free access to the street by their own separate and independent entrances without having to pass through the living quarters of another household. It is possible for several households to be contained in one dwelling.	
Saint Lucia		A dwelling unit is any building or separate and independent part of a building in which a person or group of persons (private household) are living at the time of the census enumeration. The essential features of a dwelling unit are “separateness” and “independence”.	
St. Kitts and Nevis	A private household consists of one or more persons living together (i.e. sleeping most nights of a week 4 out of 7) and sharing at least one daily meal. It is important to note that a member of a household need not be a relative of the main family. For example, a boarder or domestic servant who sleeps in most nights of the week is a member of the household. It is possible for a household to consist of just one person, or of more than one family, as long as they share living arrangements. A group of unrelated persons living together can also comprise a household.	A dwelling unit is any building or separate and independent part of a building in which a person or group of persons is living at the time of the Census Enumeration. It must have direct access from the street or common landing; staircase, passage or gallery where occupants can enter or leave without passing through anybody else’s living quarters.	This is a description of the legal and financial arrangements under which the household occupies its living quarters. For Census purposes, the following Dwelling Tenure classifications were used: Owned, Squatted, Rented-Private, Rented-Government, Leased, Rent-Free, and Other.

Country	Concept of Household	Concept of Dwelling	Concept of Tenure
Suriname		A dwelling unit is every separate and independent part of a building/house in which a person or group of persons (private household) lives or can live. The essential features are “separateness” and “independence”. A dwelling unit is separate if it has walls or another form of separation and is covered with a roof or a ceiling. A dwelling unit is independent if it has direct access from the street or a common yard, by common stairs, common passage or gallery. It is important that the inhabitants can come and go without passing through the dwelling of another household.	Right to the exclusive occupancy and use of a specified area of land or dwelling.
Trinidad and Tobago	A private household is defined as one or more persons living together and sharing at least one of the main daily meals. It is important to note that a member of the household is not necessarily a relative of the main family. For example, a boarder or a domestic employee who sleeps-in most nights of the week and shares at least one of the daily meals is also included as a member of the household.	A dwelling unit is any building or separate and independent part of a building in which a person or group of persons (private household) are living at the time of the census enumeration. The essential features of a dwelling unit are “separateness” and “independence”.	The type of tenure of the dwelling unit refers to the conditions/living arrangements under which a private household occupies all or part of it.

Appendix 2.1

2.1.1 (a) Sources of Data for Table 1.1 - Number of Households by Type of Dwelling: 2000 Round of Census

Country	Year	Data Source
ANTIGUA AND BARBUDA	2001	Basic Table Volume
THE BAHAMAS	2000	Census Data
BARBADOS	2000	Census Data
BELIZE	2000	Census Data
DOMINICA	2001	Census Data
GRENADA	2001	2001 Population and Housing Census
GUYANA	2002	Basic Table Volume
JAMAICA	2001	Census Data
MONTSERRAT	2001	Basic Table Volume
ST KITTS AND NEVIS	2001	Basic Table Volume
SAINT LUCIA	2001	2001 Population and Housing Census report
ST VINCENT AND THE GRENADINES	2001	Basic Table Volume
TRINIDAD AND TOBAGO	2000	Central Statistical Office/ 2000 Population and Housing Census
ANGUILLA	2001	Census Data
BERMUDA	2000	Census Data
BRITISH VIRGIN ISLANDS	2001	Basic Table Volume
THE TURKS AND CAICOS ISLANDS	2001	TCI 2001 Population and Housing Census

**2.1.1 (b) Notes for Table 1.1 - Number of Households by Type of Dwelling:
2000 Round of Census**

Country	Notes
ANTIGUA AND BARBUDA	Other includes Not Stated
THE BAHAMAS	Other includes Not Stated
BELIZE	Other includes Not Stated
DOMINICA	Other includes Not Stated
GRENADA	Other includes Not Stated
GUYANA	Not Stated includes Don't Know
JAMAICA	Data available in per cent
MONTSERRAT	Other includes Not Stated. Other types of dwelling include shelters.
SAINT LUCIA	Other includes Not Stated
TRINIDAD AND TOBAGO	Undivided private house refers to separate house. Out-room, Wafda and Group Dwelling are included in Other. Other private dwelling is included in Part of a private house
BRITISH VIRGIN ISLANDS	Other includes Not Stated
THE TURKS AND CAICOS ISLANDS	Other includes Not Stated. Out-room, Wafda, Other Private Dwelling and Group dwelling are included in Other. Townhouse = townhouse/condominium. Flat/apartment/condominium = apartment.

**2.1.2 (a): Sources of Data for Table 1.2 - Number of Households by Type of Tenure:
2000 Round of Census**

Country	Year	Data Source
ANTIGUA AND BARBUDA	2001	Basic Table Volume
THE BAHAMAS	2000	Census Data
BARBADOS	2000	2000 Population and Housing Census
BELIZE	2000	Census Data
DOMINICA	2001	2001 Population and Housing Census
GRENADA	2001	2001 Population and Housing Census
GUYANA	2002	Basic Table Volume
JAMAICA	2001	Statistical Institute of Jamaica, Population Census 2001
MONTSERRAT	2001	Basic Table Volume
ST KITTS AND NEVIS	2001	Basic Table Volume
SAINT LUCIA	2001	2001 Population and Housing Census report
ST VINCENT AND THE GRENADINES	2001	Basic Table Volume
TRINIDAD AND TOBAGO	2000	Census Data
ANGUILLA	2001	Census Data
BERMUDA	2000	Population and Housing Census, 2000, & 2004 Household Expenditure Survey
BRITISH VIRGIN ISLANDS	2001	Basic Table Volume
THE TURKS AND CAICOS ISLANDS	2001	Census Data

**2.1.2 (b): Notes for Table 1.2 - Number of Households by Type of Tenure:
2000 Round of Census**

Country	Notes
ANTIGUA AND BARBUDA	Not Stated includes Don't Know
DOMINICA	Other includes Not Stated
GUYANA	Not Stated includes Don't Know
MONTSERRAT	Other includes Not Stated. Other types of tenure include shelters.
ST VINCENT AND THE GRENADINES	Not Stated includes Don't Know
TRINIDAD AND TOBAGO	Not Stated includes Don't Know
ANGUILLA	Other includes Not Stated
BERMUDA	Other Includes 385 Group Dwellings
BRITISH VIRGIN ISLANDS	Not Stated includes Don't Know
THE TURKS AND CAICOS ISLANDS	Lease includes Lease-Private and Lease-Government. Rent = rented private + rented government

2.1.3 (a): Sources of Data for Table 1.3 – Number of Households by Type of Materials of Outer Walls: 2000 Round of Census

Country	Year	Data Source
ANTIGUA AND BARBUDA	2001	Basic Table Volume
THE BAHAMAS	2000	2000 Census Report
BARBADOS	2000	2000 Population and Housing Census, Volume 1
BELIZE	2000	Census Data
DOMINICA	2001	Census Data
GRENADA	2001	Census Data
GUYANA	2002	Basic Table Volume
JAMAICA	2001	Census Data
MONTserrat	2001	Basic Table Volume
ST KITTS AND NEVIS	2001	Basic Table Volume
SAINT LUCIA	2001	Census Data
ST VINCENT AND THE GRENADINES	2001	Basic Table Volume
TRINIDAD AND TOBAGO	2000	Census Data
ANGUILLA	2001	Census Data
BRITISH VIRGIN ISLANDS	2001	Basic Table Volume
THE TURKS AND CAICOS ISLANDS	2001	Census Data

2.1.3 (b): Notes for Table 1.3 – Number of Households by Type of Materials of Outer Walls: 2000 Round of Census

Country	Notes
ANTIGUA AND BARBUDA	Other includes Don't Know
THE BAHAMAS	Other includes Not Stated
BARBADOS	Other includes Not Stated
BELIZE	Other includes Not Stated
DOMINICA	Other includes Not Stated
GRENADA	Other includes Not Stated
GUYANA	Wood/ concrete block refers to Clay Brick. Not stated includes don't know.
JAMAICA	Other includes Not Stated
MONTSERRAT	Other includes Not Stated; Not Stated includes Don't Know. Other types of walls include sheet rock, galvanise, etc.
SAINT LUCIA	Other includes Not Stated
ST VINCENT AND THE GRENADINES	Other includes Not Stated
TRINIDAD AND TOBAGO	Wood/ galvanise refers to wood/ concrete block/ galvanise/ Stucco. Abode refers to wattle/adobe/tapia
ANGUILLA	Other includes Not Stated
BRITISH VIRGIN ISLANDS	Other includes Not Stated
THE TURKS AND CAICOS ISLANDS	Other includes Not Stated. Wood/concrete block/galvanise. Stucco refers to Wood/Stucco

2.1.4 (a): Sources of Data for Table 1.4 - Number of Households by Type of Material Used for Roofing: 2000 Round of Census

Country	Year	Data Source
ANTIGUA AND BARBUDA	2001	Basic Table Volume
BARBADOS	2000	2000 Population and Housing Census, Volume 1
BELIZE	2000	Census Data
DOMINICA	2000	2001 Population and Housing Census
GRENADA	2001	2001 Population and Housing Census
GUYANA	2002	Basic Table Volume
JAMAICA	2001	Population Census 2001
MONTSERRAT	2001	Basic Table Volume
ST KITTS AND NEVIS	2001	Basic Table Volume
SAINT LUCIA	2001	2001 Population and Housing Census report
ST VINCENT AND THE GRENADINES	2001	Basic Table Volume
ANGUILLA	2001	Census 2001
BRITISH VIRGIN ISLANDS	2001	Basic Table Volume
THE TURKS AND CAICOS ISLANDS	2001	TCI 2001 Population & Housing Census

2.1.4 (b): Notes for Table 1. 4 - Number of Households by Type of Material Used for Roofing: 2000 Round of Census

Country	Notes
ANTIGUA AND BARBUDA	Other includes Don't Know
DOMINICA	Other includes Don't Know
GUYANA	Not Stated includes Don't Know
JAMAICA	Other includes Not Reported
MONTSERRAT	Not Stated includes Don't Know
ST VINCENT AND THE GRENADINES	Other includes Don't Know
ANGUILLA	Make-shift includes Thatched
BRITISH VIRGIN ISLANDS	Other refers to Other/Don't Know/Not Stated

2.1.5 (a): Sources of Data for Table 1.5 - Number of Households by Number of Bedrooms: 2000 Round of Census

Country	Year	Data Source
ANTIGUA AND BARBUDA	2001	Basic Table Volume
THE BAHAMAS	2000	Census Data
BARBADOS	2000	2000 Population and Housing Census, Volume 1
BELIZE	2000	Census Data
DOMINICA	2000	Census Data
GRENADA	2001	Census Data
GUYANA	2002	Basic Table Volume
JAMAICA	2001	Census Data
MONTserrat	2001	Basic Table Volume
ST KITTS AND NEVIS	2001	Basic Table Volume
SAINT LUCIA	2001	Census Data
ST VINCENT AND THE GRENADINES	2001	Basic Table Volume
TRINIDAD AND TOBAGO	2000	Census Data
ANGUILLA	2001	Census Data
BERMUDA	2000	Population and Housing Census, 2000, & 2004 Household Expenditure Survey
BRITISH VIRGIN ISLANDS	2001	Basic Table Volume
THE TURKS AND CAICOS ISLANDS	2001	Census Data

2.1.5 (b): Notes for Table 1.5 - Number of Households by Number of Bedrooms: 2000 Round of Census

Country	Notes
JAMAICA	Other includes Not Reported
MONTserrat	Not Stated/ Don't Know includes Not Stated and Undefined
TRINIDAD AND TOBAGO	The average number of bedrooms could not be calculated.
BERMUDA	No bedroom refers to Studio dwelling (0 bedrooms) Total number of households. Excludes 385 Group dwelling households

**2.1.6 (a): Sources of Data for Table 1.6 - Number of Households by Size of Household:
2000 Round of Census**

Country	Year	Data Source
THE BAHAMAS	2000	Census Data
BARBADOS	2000	2000 Population and Housing census, Volume 1
BELIZE	2000	Census data
DOMINICA	2000	1991 and 2001 Population and Housing Census
GUYANA	2002	Basic Table Volume
JAMAICA	2001	Census Data
MONTSERRAT	2001	Basic Table Volume
ST KITTS AND NEVIS	2001	Basic Table Volume
ST VINCENT AND THE GRENADINES	2001	Basic Table Volume
SURINAME	2004	Census Data
TRINIDAD AND TOBAGO	2000	Central Statistical Office/ 2000 Population and Housing Census
ANGUILLA	2001	Census Data
BERMUDA	2000	Population and Housing Census, 2000, & 2004 Household Expenditure Survey
BRITISH VIRGIN ISLANDS	2001	Basic Table Volume
THE TURKS AND CAICOS ISLANDS	2001	TCI 2001 Population and Housing Census

**2.1.6 (b): Notes for Table 1.6 - Number of Households by Size of Household:
2000 Round of Census**

Country	Notes
BERMUDA	Group dwellings represent 385 households which are dispersed throughout the table.

**TOR1 (a): TOURIST ARRIVALS BY TYPE OF ARRIVAL
AND NUMBER OF TOURIST NIGHTS SPENT**

DK

Concept and Definition

A visitor is a traveler taking a trip to a main destination outside his/her usual environment, for less than a year, for any main purpose (business, leisure or other personal purpose) other than to be employed by a resident entity in the country or place visited. These trips taken by visitors qualify as tourism trips. *Tourism* refers to the activity of visitors. (Please refer to the 2008 International Recommendations for Tourism Statistics (IRTS) for United Nations World Tourism Organization and United Nations Statistics Division)

Visitor: A visitor is a traveler taking a trip to a main destination outside his/her usual environment, for less than a year, for any main purpose (business, leisure or other personal purpose) other than to be employed by a resident entity in the country or place visited. These trips taken by visitors qualify as tourism trips. (IRTS 2008 para. 2.13.)

Stopover: A visitor (domestic, inbound or outbound) is classified as a *tourist* (or overnight visitor), if his/her trip includes an *overnight* stay, or as a same-day visitor (or excursionist) otherwise. (IRTS 2008 para. 2.13.)

Same-day visitor (or excursionist): A visitor (domestic, inbound or outbound) is classified as a tourist (or overnight visitor), if his/her trip includes an overnight stay, or as a *same-day visitor* (or excursionist) otherwise. (IRTS 2008 para. 2.13.)

Cruise passengers are regarded as a special type of same-day visitor (even if the ship overnights at the port) who stay less than twenty-four hours in the country visited.

Cruise ship arrivals refer to the number of times cruise ships enter the country. A cruise ship can be counted multiple times if it leaves the country, then returns with new passengers within the same month.

Number of tourist nights spent refers to the number of nights that a guest actually spends (sleeps or stays) or is registered (his/her physical presence there being unnecessary) in a collective accommodation establishment or in private tourism accommodation.

Method of Computation

Data for this indicator was obtained through the analysis of the embarkation/disembarkation (E/D) cards which must be completed for the various immigration authorities, as part of the frontier formalities, by visitors on arrival at the destination.

Some tourists visit more than one country while in the Caribbean or may make repeat visits to a particular destination. In such cases, each visit is recorded as a new arrival. It should also be noted that there are a significant number of Caribbean residents visiting other countries in the Region. This intra-Caribbean travel is done largely by those on business and those visiting friends and relatives.

Nights spent by residents and non-residents: Overnight stays are calculated by country of residence of the guest and by month. Normally, the date of arrival is different from the date of departure, but persons arriving after midnight and leaving on the same day are included in overnight stays. A person should not be registered in two accommodations at the same time. The overnight stays of non-tourists (e.g. refugees) should be excluded, if possible.

Indicator Relevance

Tourism exerts pressures on the existing scarce resources in a country and generates a disproportionately high level of waste, which must be managed in an organized manner. Data on tourist arrivals, therefore, indicate tourism hotspots and pressures on the environment linked to land use and resources, as well as travel levels. They also provide information on other needs of tourists that may have environmental and social implications (accommodation, public catering, transport in cities, employment, etc.). *(Please refer to the European Environment Agency's website at http://themes.eea.europa.eu/Sectors_and_activities/tourism/indicators/tourism_intensity [last accessed: June 15th 2009])*

The duration of stay is a very important statistical datum since besides being the most significant measure of the volume of tourism of any kind, it is instrumental in establishing the maximum limit beyond which the visit is no longer considered a tourism visit (one year) and in distinguishing between tourists and same day visitors. The duration of stay or trip is also useful, albeit indirectly, for assessing tourism expenditure, especially if the average duration is calculated for homogeneous groups of visitors or trips.

An increase in the number and size of cruise ships, and hence an increase in the number of cruise passengers, puts pressure on countries to increase the size of their harbour and the number of facilities that are available for cruise passengers. Cruise ships in the Caribbean are also estimated to produce more than 70,000 tons of waste each year. Solid waste and littering can degrade the physical appearance of the water and shoreline and can cause the death of marine animals.

Data Assessment

Fourteen Member States and Associate Members reported data on the number of Non-residents (stop over) arrivals or Tourists. Bermuda reported data on the number of Non-residents arrivals for all tables. With the exception of Belize no country provided the definition of Non-residents (stop over) arrivals. Belize reported that Non-residents (stop over) refers to

overnight tourists. It is therefore difficult to assess how categories of arrivals such as Nationals residing abroad, Transit passengers, Crews and Frequent border crossers were classified when compiling the data.

St. Vincent and the Grenadines and The British Virgin Islands also reported data for same-day visitors and day trippers respectively.

Of the nine countries that provided data for the number of tourist nights spent, five provided the average number of nights spent and the remaining countries provided data for the total number of nights spent. Those five countries were Dominica, Grenada, Jamaica, The British Virgin Islands and The Turks and Caicos Islands.

Data Sources

The main data sources for the information provided in this report are the Central Statistical Offices and the National Tourist Offices of the individual countries. Details are given in the notes to the tables in Appendix 1.2.1 (a).

Evaluation

Data on Tourist arrivals by type of arrivals is presented in **Table 2.1 (a)** below. For the period 1990 to 2004 countries reported steady increases overall with declines in the number of tourist arrivals in the year 2001 and 2002. The number of *Stop over* tourist arrivals to the Region has since increased. Tourist arrivals was greater in The Bahamas and Jamaica than other countries in the Region with tourist arrivals to the Bahamas averaging more than 1.5 million visitors per year while Jamaica averaged 1 million tourists per year. The Bahamas was also the favorite destination for cruise passengers followed by Jamaica during the period. *Cruise Passenger* arrivals increased in most Member States after 2001 in comparison to the declines in tourist arrivals by air. Of the countries which supplied data in 2004, Cruise ship arrivals were greater in The Bahamas (43.9 per cent), Barbados (11.4 per cent) and Jamaica (10.4 per cent).

Table 2.1 (a) Tourists, Same-day Visitors, Cruise ships arrivals and Average/Number of Tourist nights spent by year: 1990, 1995, 1998-2004

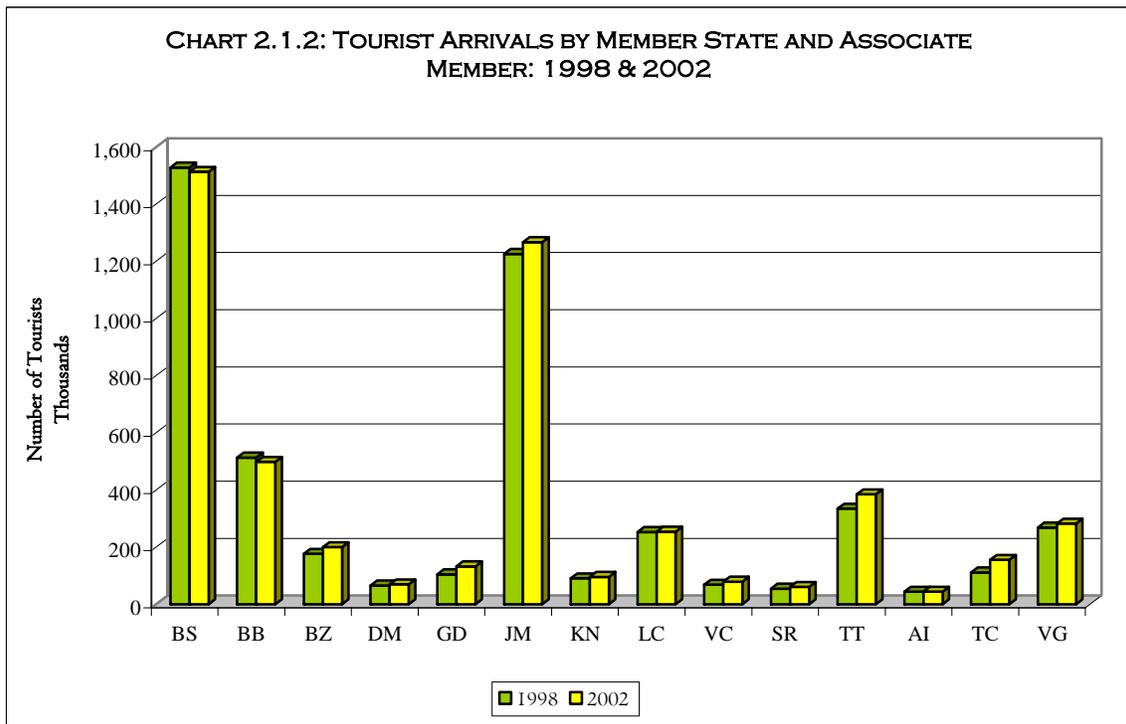
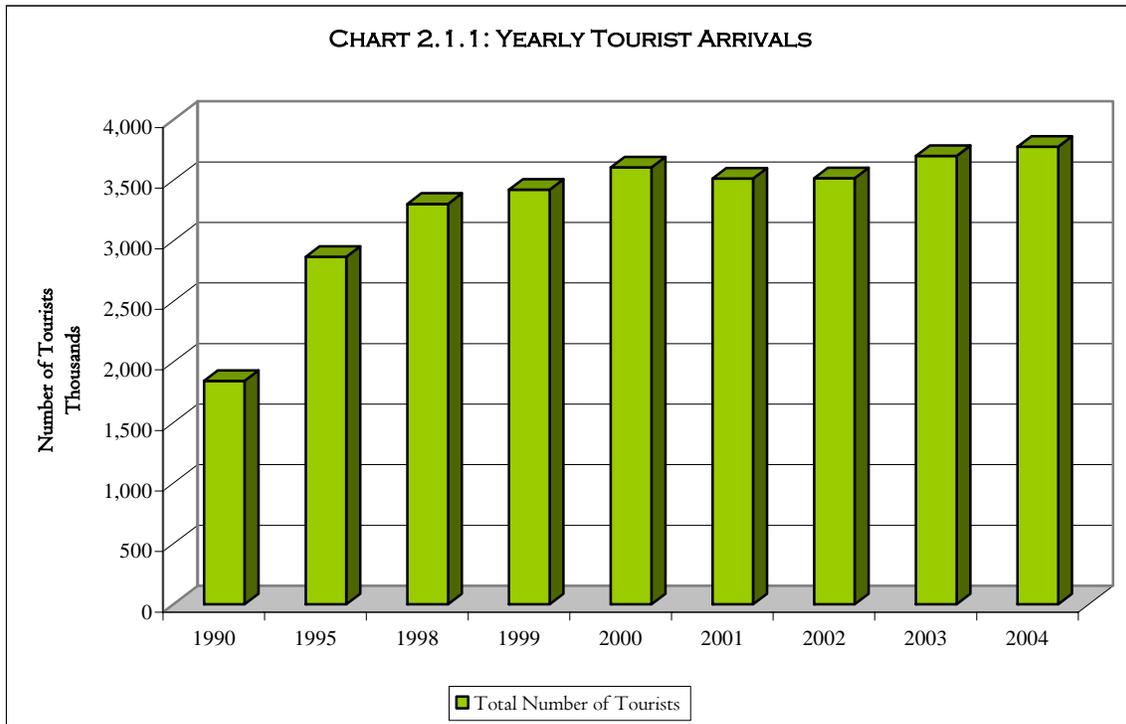
Country	Year	Stop over (Tourists)	Same-day Visitors		Cruise ships arrivals	Average/Number of tourists nights spent
			Cruise passengers	Other		
BS	1990	1,561,665	1,853,897	...	...	8,962,855
	1995	1,598,135	1,543,495	...	1,771	9,031,455
	1998	1,527,707	1,729,894	...	1,482	...
	1999	1,577,066	1,981,471	...	1,891	...
	2000	1,543,959	2,512,626	...	1,875	9,048,361
	2001	1,537,780	2,551,673	...	...	8,972,782
	2002	1,513,151	2,802,112	...	1,759	8,703,805
	2003	1,510,169	2,970,174	...	1,976	8,956,743
	2004	1,561,312	3,360,012	...	2,068	9,898,181
BB	1990	432,092	362,611	...	534	2,306,825
	1995	442,107	484,670	...	573	437,401
	1998	512,614	506,610	...	446	2,485,688
	1999	514,614	432,854	...	404	2,459,605
	2000	544,696	533,278	...	485	2,695,000
	2001	507,078	527,597	...	453	507,078
	2002	497,899	523,253	...	423	497,899
	2003	531,211	559,119	...	442	2,031,313
	2004	551,502	721,270	...	539	2,460,447
BZ						(average)
	1995	130,809	7,953	...	...	...
	1998	176,054	14,183	...	...	...
	1999	180,795	34,130	...	52	...
	2000	195,766	58,131	...	70	7.6
	2001	195,955	48,116	...	48	7.6
	2002	199,521	319,690	...	200	7.6
	2003	220,574	575,196	...	315	6.8
2004	230,832	851,436	...	406	...	
DM						(average)
	1990	45,087	6,777	...	40	...
	1995	60,471	134,921	...	267	...
	1998	65,501	244,603	...	268	9.4
	1999	73,506	202,003	...	263	9.2
	2000	69,598	239,796	...	287	9.2
	2001	66,393	207,627	...	231	7.8
	2002	69,193	136,859	...	187	8.6
	2003	73,190	177,044	...	206	9.7
2004	80,077	383,614	...	299	9.5	
GD						(average)
	1990	82,008	183,159	...	343	...
	1995	94,552	249,879	...	446	7.4
	1998	104,151	265,875	...	328	7.4
	1999	114,540	245,461	...	369	7.3
	2000	128,864	180,308	...	360	7.2
	2001	123,351	147,381	...	288	7.2
	2002	132,416	135,061	...	259	7.3
	2003	142,355	146,925	...	267	7.7
2004	133,865	229,800	...	249	7.5	

Table 2.1 (a) Cont'd. Tourists, Same-day Visitors, Cruise ships arrivals and Average/Number of Tourist nights spent by year: 1990, 1995, 1998-2004

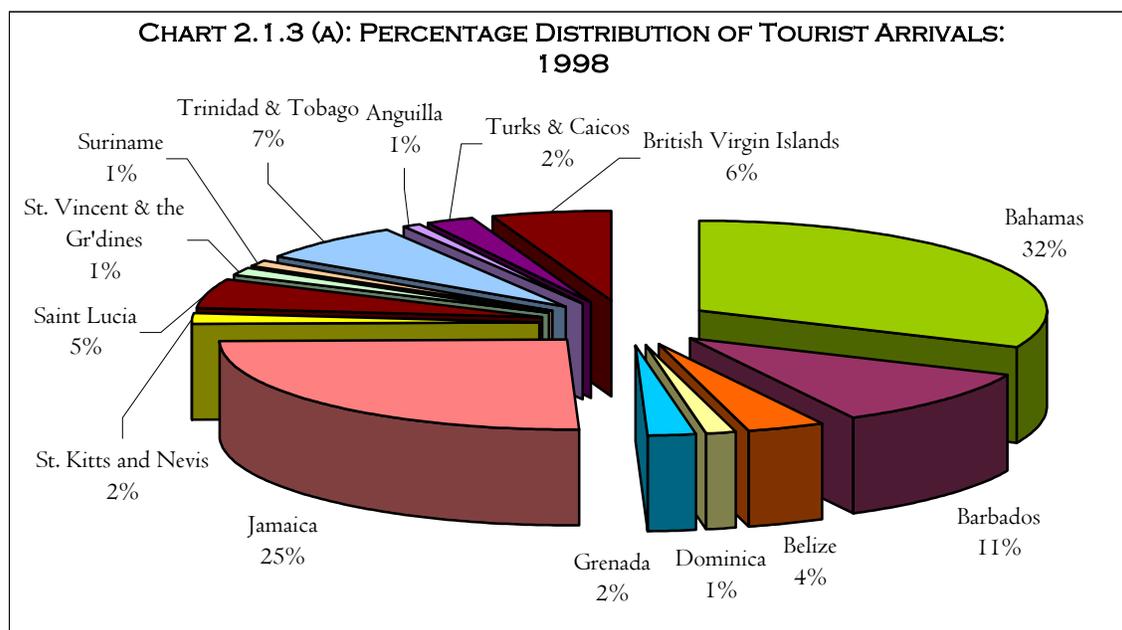
Country	Year	Stop over (Tourists)	Same-day Visitors		Cruise ships arrivals	Average/Number of tourists nights spent
			Cruise passengers	Other		
JM						(average)
	1990	840,777	385,205	...	336	11
	1995	1,147,001	605,178	...	440	11
	1998	1,225,287	673,690	...	457	11
	1999	1,248,397	764,341	...	488	10
	2000	1,322,690	907,611	...	499	10
	2001	1,276,516	840,337	...	423	10
	2002	1,266,366	865,419	...	396	10
	2003	1,350,285	1,132,596	...	510	10
2004	1,414,786	1,099,773	...	482	10	
KN	1995	98,848	121,405	...	...	...
	1998	90,566	162,821	...	...	...
	1999	84,002	144,912	...	...	...
	2000	73,149	164,611	...	...	...
	2001	70,565	252,172	...	...	...
	2002	95,677	167,230	...	...	...
	2003	...	146,317	...	...	...
LC	1990	140,987	101,948	...	226	1,480,364
	1995	231,259	169,571	...	265	2,081,331
	1998	252,237	372,068	...	345	2,320,580
	1999	263,793	351,233	...	356	2,400,516
	2000	269,850	443,551	...	389	2,576,999
	2001	250,132	489,912	...	378	2,426,045
	2002	253,463	387,180	...	245	2,337,255
	2003	276,948	393,240	...	262	2,602,450
	2004	298,431	481,279	...	328	2,811,351
VC	1990	60,206	85,258	31,154	...	...
	1995	67,228	34,903	20,882	...	...
	1998	68,293	47,743	17,468	...	...
	1999	72,895	86,247	21,135	...	...
	2000	70,636	76,494	15,049	...	...
	2001	77,631	70,314	13,062	...	...
	2002	78,535	64,608	13,696	...	...
	2003	86,721	77,585	12,936	225	...
	2004	95,505	69,391	8,928	181	...
SR	1998	54,585	...	...	...	...
	1999	57,275	...	...	...	...
	2000	56,841	...	...	...	...
	2001	54,341	...	...	...	...
	2002	60,223	...	...	...	...
	2003	82,298	...	...	...	...

Table 2.1 (a) Cont'd. Tourists, Same-day Visitors, Cruise ships arrivals and Average/Number of Tourist nights spent by year: 1990, 1995, 1998-2004

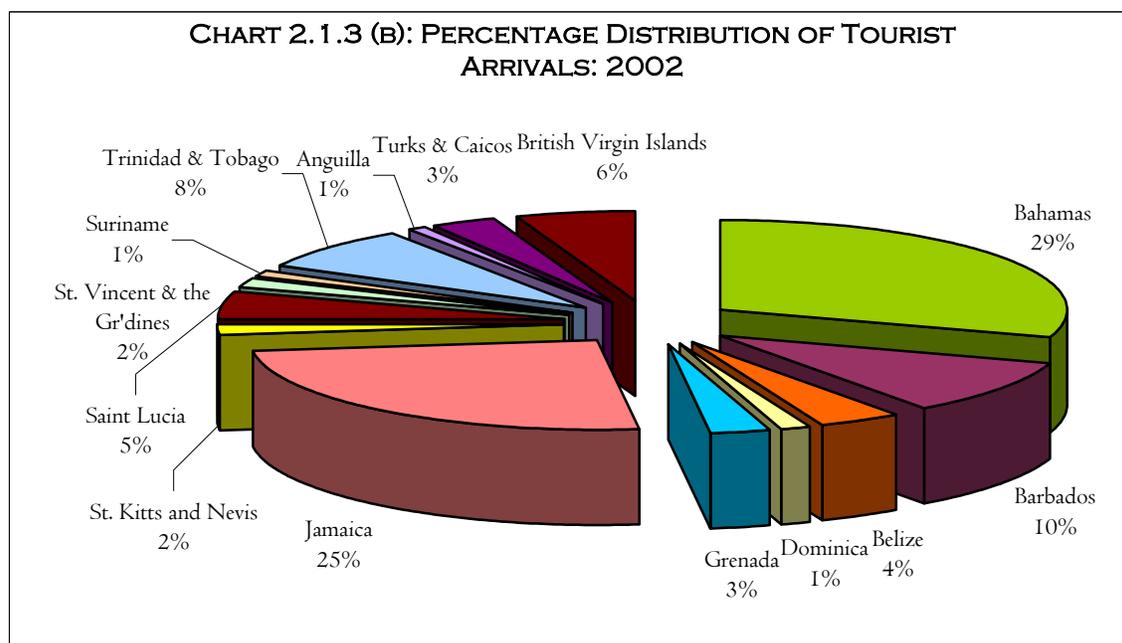
Country	Year	Stop over (Tourists)	Same-day Visitors		Cruise ships arrivals	Average/Number of tourists nights spent
			Cruise passengers	Other		
TT	1990	194,521	...	...	...	...
	1995	259,784	...	...	...	...
	1998	334,037	43,188	...	91	...
	1999	358,193	63,251	...	117	...
	2000	398,559	104,061	...	146	...
	2001	383,101	82,245	...	136	...
	2002	384,214	60,047	...	96	...
	2003	409,071	55,532	...	88	...
	2004	442,596	54,254	...	86	...
ASSOCIATE MEMBERS						
AI	1995	38,531	...	...	...	366,348
	1998	43,874	...	...	...	404,468
	1999	46,782	...	...	...	398,647
	2000	43,789	...	...	...	376,457
	2001	47,965	...	...	...	410,673
	2002	43,969	...	...	...	369,583
	2003	46,915	3,871	...	92	395,874
	2004	53,987	6,383	...	64	419,185
BM	1990	...	112,551	...	...	...
	1995	...	169,712	...	...	...
	1998	...	188,331	...	...	...
	1999	...	195,586	...	14	...
	2000	...	209,727	...	173	...
	2001	...	179,435	...	136	...
	2002	...	200,065	...	140	...
	2003	...	226,097	...	158	...
2004	...	206,133	...	...	...
VG	1995	219,510	122,054	...	...	...
	1998	267,715	115,231	...	...	...
	1999	285,858	180,714	...	...	...
	2000	281,119	188,522	...	...	...
	2001	295,625	202,518	...	...	...
	2002	281,696	230,067	...	...	...
	2003	317,758	300,415	...	...	...
2004e	303,756	466,601	...	...	...
TC	1990	48,756	...	...	...	(average) ...
	1995	78,957	...	...	...	6.1
	1998	110,855	...	...	...	6.3
	1999	120,898	...	...	...	6.3
	2000	151,372	15,368	...	...	6.5
	2001	165,836	...	...	...	6.4
	2002	154,961	2,411	...	...	6.5
	2003	164,100	49,734	...	...	6.5



Note: OECS Countries include Antigua and Barbuda, Dominica, Grenada, Montserrat, Saint Lucia and St. Vincent and the Grenadines.
Associate Members include Anguilla, Bermuda, The Turks and Caicos Islands and The British Virgin Islands.



Note: OECS Countries include Antigua and Barbuda, Dominica, Grenada, Montserrat, Saint Lucia and St. Vincent and the Grenadines. Associate Members include Anguilla, The Turks and Caicos Islands and The British Virgin Islands.



Note: OECS Countries include Antigua and Barbuda, Dominica, Grenada, Montserrat, Saint Lucia and St. Vincent and the Grenadines. Associate Members include Anguilla, The Turks and Caicos Islands and The British Virgin Islands.

TOR1 (b): TOURIST INTENSITY/GROWTH RATE AND TOURIST PENETRATION RATIO

H

Concept and Definition

Tourist intensity/growth rate measures the impact of the tourism industry per kilometer square. The information required for this indicator includes tourist arrivals and total land area. From these data, the increase in the number of tourists per annum per one kilometer square is obtained.

The *Tourist Penetration Ratio* quantifies the average number of tourists per thousand inhabitants in the country at any one time.

Method of Computation

Embarkation/disembarkation (E/D) cards were analyzed to monitor tourist growth. These E/D cards are completed for the various immigration authorities, as part of the frontier formalities, by visitors on arrival at the destination.

Tourist Penetration Ratio = $\frac{\text{Average Length of stay} * \text{number of visitors}}{365 * \text{mid year population estimates}}$

Tourist intensity/growth rate = $\frac{\text{Average Length of stay} * \text{number of visitors}}{365 * \text{area in square kilometers}}$

Indicator Relevance

Tourism is one of the most important social and economic activities in the Caribbean. While bringing economic and employment gains, tourism also uses up resources and different tourist activities can create a wide variety of stress, damage and pollution in the host area. Therefore, the purpose of the tourist intensity indicator is to measure the overall pressure brought to host areas.

The tourist penetration ratio gives an indication of crowding and can also be a useful measure for monitoring carrying capacity. As more tourists flock to the Region, the demand for accommodation increases. Turning a rural area into a tourist destination comes at a cost—transport links, particularly roads, need to be built; water resources are exploited; waste needs to be treated and unfortunately, ecologically sensitive areas are compromised.

The Tourist intensity/growth rate is an indicator of social carrying capacity, which expresses both the level of tolerance on the part of the host population and the quality of

the international tourist experience in the host country. (Please refer to *The International Handbook on the Economics of Tourism* By Larry Dwyer, Peter Forsyth)

Data Assessment

Data were obtained from two Member States and one Associate Member for both indicators. The Member States were Belize and Dominica and the Associate Member was The Turks and Caicos Islands. The definitions for tourist intensity/growth rate and tourist penetration ratio were provided to the reporting countries. None of the countries indicated that they had deviated from the definitions provided, so it was assumed that the international definitions were followed. This indicator is harmonized.

Data Sources

The main data sources for this indicator were the Central Statistical Offices and the National Tourist Offices of the individual countries.

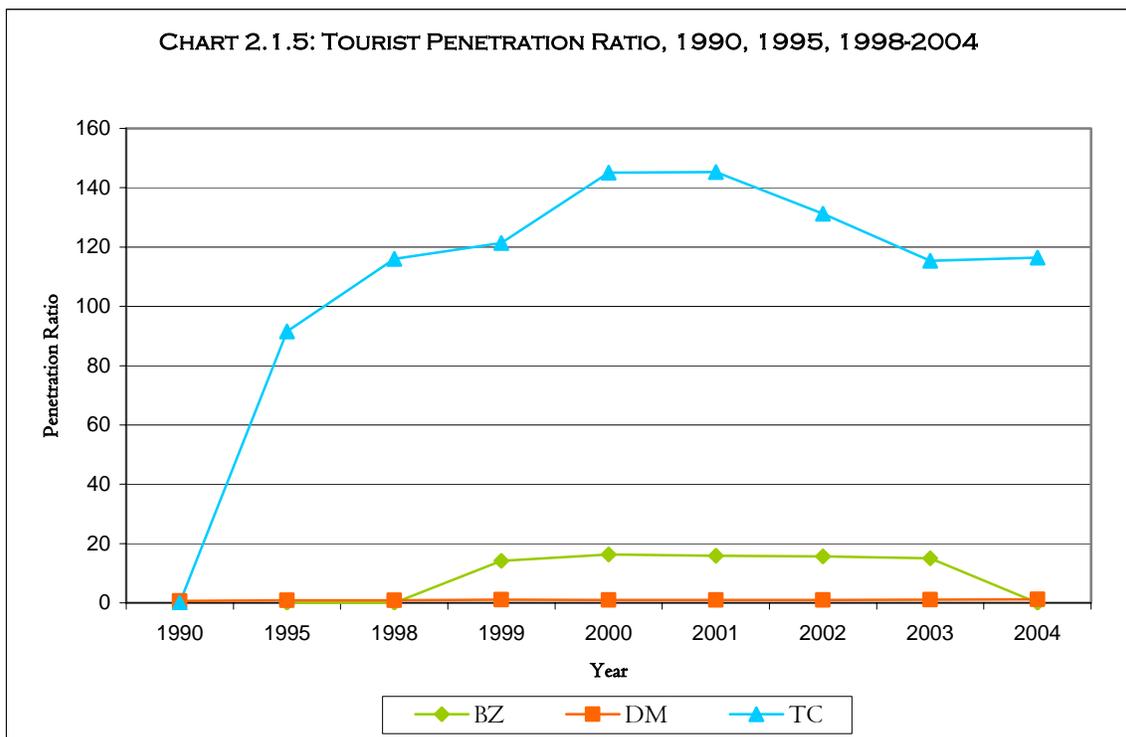
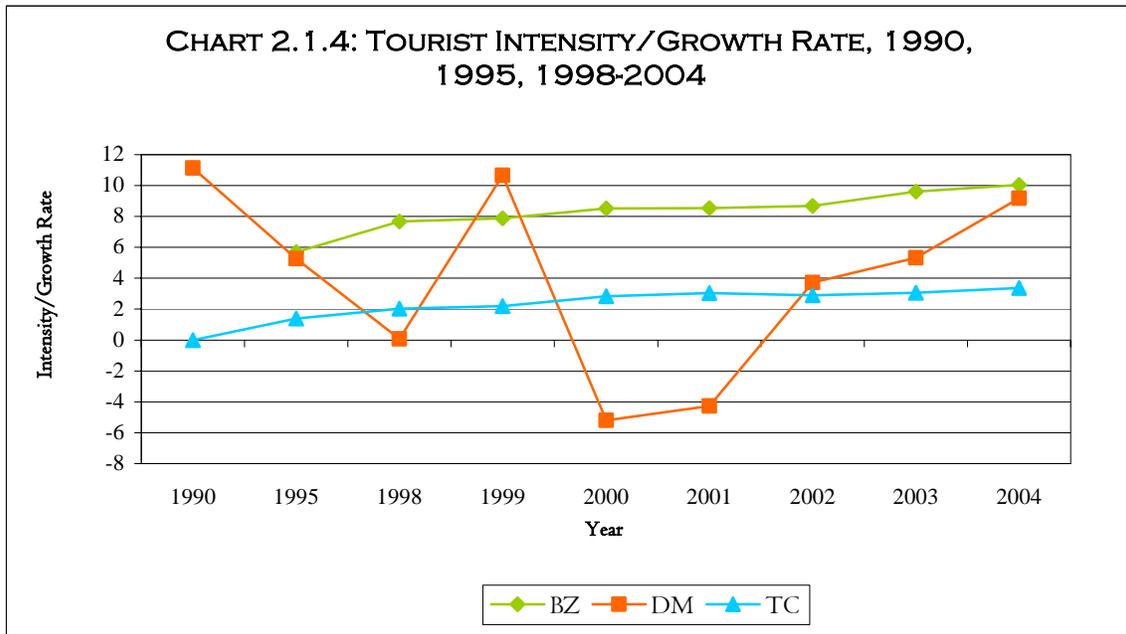
Evaluation

The Tourist penetration ratio is presented in **Table 2.1 (b)** below with the tourist intensity ratio for three countries Belize, Dominica and The Turks and Caicos Islands. Both ratios experienced slight disturbances between 2000 and 2001. The Tourist penetration ratio for Dominica has stabilized since 1999 at an average of 100 tourists per thousand inhabitants. For Belize, the tourism penetration ratio was also stable with an average of 15.4 tourists per thousand inhabitants for the period 1999 to 2003. The Turks and Caicos Islands experienced small fluctuations in the tourism penetration ratio, increasing by 58 per cent from 92 tourists per thousand inhabitants in 1995 to 145 tourists per thousand inhabitants in 2000 and 2001 and thereby experiencing a 19 per cent decline to 116 tourists per thousand inhabitants.

The Tourist intensity ratio for Dominica experienced major fluctuation through out the period ranging from 11.1 persons per annum per 1 square kilometer in 1990 to the lowest recorded at -5.2 persons per annum per 1 square kilometer in 2000. Belize saw gradual increases in the tourist intensity ratio moving from 5.2 in 1995 to 10.1 in 2004. Of the three countries which supplied data on this indicator, The Turks and Caicos Islands had the lowest average of 2.6 persons per annum per 1 square kilometer from 1995 to 2004. The Associate Member also saw increases in the ratio from 1.4 persons per annum per 1 square kilometer in 1995 to 3.4 persons per annum per 1 square kilometer in 2004.

**Table 2.1 (b) Tourist Intensity / growth rate and Tourist penetration ratio:
1990, 1995, 1998-2004**

Country	Year	Tourist Intensity / growth	Tourist penetration ratio
BZ	1995	5.7	...
	1998	7.7	...
	1999	7.9	14.2
	2000	8.5	16.3
	2001	8.5	15.9
	2002	8.7	15.7
	2003	9.6	15.0
	2004	10.1	...
DM	1990	11.1	63.0
	1995	5.3	83.0
	1998	0.1	91.0
	1999	10.7	102.0
	2000	-5.2	97.0
	2001	-4.3	94.0
	2002	3.7	98.0
	2003	5.3	104.0
2004	9.2	113.0	
TC	1995	1.4	91.6
	1998	2.0	116.0
	1999	2.2	121.4
	2000	2.8	145.1
	2001	3.0	145.3
	2002	2.9	131.2
	2003	3.1	131.7
	2004	3.4	123.0



**TOR2: NUMBER OF HOTELS CLASSIFIED BY SIZE,
BEDS AND ROOMS BY YEAR**

PH

Concept and Definition

The number of hotels classified by size, beds and rooms by year refers to the number, size, and type of hotels available for use within the hospitality industry.

Hotels: Hotels and similar establishments are typified as being arranged in rooms, in number exceeding a specified minimum; as coming under a common management; as providing certain services including room service, daily bed-making and cleaning of sanitary facilities; as grouped in classes and categories according to the facilities and services provided; and as not falling in the category of specialised establishments. Hotels comprise: Commercial hotels, apartment hotels, motels, roadside inns, beach hotels, residential clubs and similar establishments providing accommodation services, including more than daily bed-making and cleaning of the room and sanitary facilities.

Number of rooms: The number of existing rooms is the number the establishment habitually has available to accommodate guests (overnight visitors), excluding rooms used by the employees working for the establishment. If a room is used as a permanent residence (for more than a year), it should not be included. Bathrooms and toilets do not count as a room. An apartment is a special type of room. It consists of one or more rooms and has a kitchen unit and its own bathroom and toilet.

Number of beds: This is the total number of beds available only for guests. Only beds serving for tourism are included; occasional beds are not included.

Room occupancy rate: For hotels and similar establishments, the net rate of room occupancy is a measure of capacity utilization. It is calculated by dividing the monthly or yearly sum of occupied rooms by the number of rooms available for use, then multiplying the quotient by 100 to express the rate as a percentage.

(Please refer to the Caribbean Tourism Statistical Report 2002-2003 (2004) pg. 299.)

(Please also refer to the Eurostat, Statistical Office of the European Communities website at <http://epp.eurostat.ec.europa.eu/portal/page/portal/tourism/introduction> [last accessed: June 15th 2009])

Method of Computation

$$\text{Room Occupancy Rate} = \frac{\text{Number of occupied rooms}}{\text{Number of rooms available for use}} \times 100$$

Indicator Relevance

The number of beds and the number of rooms in the hotel industry is a measure of the capacity of accommodation in the host country. A measure of the capacity of accommodation gives an indication of the amount of energy and water used and the amount of waste produced.

Data Assessment

Data on the total number of rooms occupied and on the number of hotels by the number of rooms were sparse with only a few countries submitting detailed data. On the other hand, data on the number of beds available and on occupancy rates were dense with detailed information provided by the Member States and Associate Members.

Member States and Associate Members did not specify what constitutes a hotel. It was, therefore, assumed that an establishment was classified across the Region as a hotel if it consisted of five or more rooms for the purpose of tourism.

In the calculation of the room occupancy rate, all Member States and Associate Members, except The Turks and Caicos Islands, followed the Caribbean Tourism Organization's definition of room occupancy rate. The Turks and Caicos Islands retrieved the data directly from The Turks and Caicos Islands Hotel & Tourism Association, whose rate reflects data for its members only and not for accommodation establishments across the country.

Data Sources

Please refer to the similar section in indicator TOR1(a).

Evaluation

The data in **Table 2.2** shows the number of hotels by the number of rooms, total number of rooms occupied, the number of beds available and occupancy rates. Detailed data on the number of hotels by the number of rooms are available for five countries. Jamaica recorded the highest number of hotels, more than 80 hotels with 50 rooms or more and more than 2,000 hotels with less

than 50 rooms in 2004. At the end of 2004, The Bahamas recorded 46 hotels with 50 rooms or more and 254 hotels with less than 50 rooms. Saint Lucia recorded a total of 135 hotels in 2004 of which 19 hotels had more than 50 rooms. The Turks and Caicos Islands reported 38 hotels with 10 having 50 rooms or more whilst Grenada reported a total of 20 hotels with 7 hotels having 50 rooms or more in the year 2004.

With the exception of Grenada and Jamaica, the number of hotels increased in 2004 from the previous year for most of the countries for which more than one year of data were available, although it should be noted that some hotels in Grenada closed due to the damage caused by Hurricane Ivan in 2004. Data on the number of beds are given in **Table 2.2** for ten countries. The trend in the number of beds followed that of the number of hotels. Of the countries which presented data, The Turks and Caicos Islands, Jamaica, Belize and The Bahamas saw increases in the number of hotel beds over time while Barbados, Saint Lucia and Bermuda saw fluctuations in the number of hotel beds available. Prior to 2004 the number of hotel beds in Grenada increased gradually from 2,936 in 1990 to 3,844 in 2003.

Data on the total number of rooms occupied were supplied for five Member States of which The Bahamas recorded the highest with an average of more than 2 million hotel beds occupied per year. Data on the number of rooms occupied revealed overall increases for Jamaica, Belize and The Bahamas with one decline observed in 2002 for Belize and two declines in 2001 and 2003 for The Bahamas. Total number of rooms occupied fluctuated in Grenada and Saint Lucia during the period 1990 to 2004 declining from the beginning of the period.

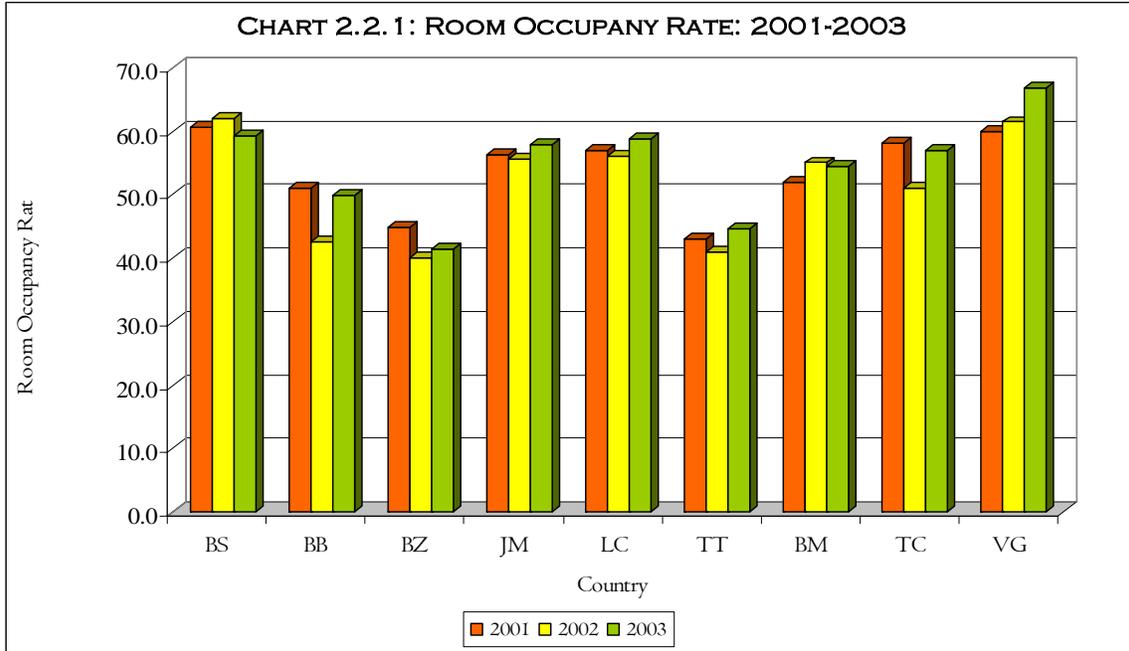
Hotel room occupancy rate could not be compared by country due to the variations in the types of establishments covered by the figures; however the figures supplied reveal that, Saint Lucia and The Bahamas recorded the highest average room occupancy rates of 66 and 64 per cent respectively.

Table 2.2 - Number of Hotels classified by Size, Beds and Rooms by Year: 1990, 1995, 1998-2004

Country	Year	Number of hotels by size					Number of beds	Total number of rooms occupied	Room occupancy rate
		Rooms 5 and more and less than 10	Rooms 10 and more and less than 25	Rooms 25 and more and less than 50	Rooms 50 and more	Total			
BS	1995	...	...	...	...	...	26,842	...	59.7
	1998	...	...	...	...	...	28,486	1,848,092	70.3
	1999	...	...	...	...	...	28,306	2,088,985	68.6
	2000	...	...	...	...	...	29,402	2,199,298	67.2
	2001	96	91	38	47	272	30,390	2,117,973	60.5
	2002	108	99	36	45	288	30,290	2,134,962	62.0
	2003	105	98	39	47	289	30,786	2,105,713	59.2
	2004	113	102	39	46	300	31,016	2,132,153	65.1
BB	1990	...	...	...	...	...	13,767	...	57.5
	1995	...	...	...	...	...	10,229	...	57.9
	1998	...	...	...	...	...	11,661	...	58.6
	1999	...	...	...	...	...	11,006	...	55.9
	2000	...	...	...	...	...	12,240	...	56.9
	2001	...	...	...	...	...	13,176	...	51.1
	2002	...	...	...	...	...	13,050	...	42.5
	2003	...	...	...	...	...	10,770	...	49.9
2004	...	...	...	...	...	11,237	...	49.7	
BZ	1990	...	...	...	...	210	3,451	...	...
	1995	...	...	...	...	362	6,137	...	...
	1998	...	...	...	...	408	6,617	1,172	29.9
	1999	...	...	...	...	390	6,810	1,244	31.4
	2000	...	...	...	...	391	7,045	1,712	41.7
	2001	...	...	...	...	418	7,187	1,999	44.8
	2002	...	...	...	...	437	7,902	1,887	40.1
	2003	...	...	...	...	466	8,166	2,086	41.3
2004	...	...	...	...	506	8,722	2,096	40.7	
GD	1995	...	...	...	...	27	2,936	1,652	...
	1998	...	...	...	...	28	2,995	1,802	...
	1999	...	...	...	...	27	3,274	1,800	...
	2000	...	...	...	...	30	3,091	1,822	...
	2001	...	...	...	...	28	3,142	1,734	...
	2002	...	...	...	...	28	3,590	1,777	...
	2003	...	...	...	...	25	3,844	1,758	...
	2004	1	7	5	7	20	1,792	860	...
JM	1990	...	...	...	...	1,352	32,863	16,103	62.1
	1995	...	...	1,876	69	1,945	43,370	20,896	60.8
	1998	...	...	1,866	74	1,940	46,966	22,715	58.7
	1999	...	...	2,106	74	2,180	47,582	23,067	57.0
	2000	...	...	2,094	79	2,173	48,892	23,630	58.5
	2001	...	...	2,081	79	2,160	50,265	24,007	56.3
	2002	...	...	2,101	80	2,181	50,742	24,239	55.5
	2003	...	...	2,107	85	2,192	51,494	24,625	57.9
2004	...	...	2,043	84	2,127	51,614	24,947	61.4	

Table 2.2 Contd. Number of Hotels classified by Size, Beds and Rooms by Year: 1990, 1995, 1998-2004

Country	Year	Number of hotels by size					Number of beds	Total number of rooms occupied	Room occupancy rate
		Rooms 5 and more and less than 10	Rooms 10 and more and less than 25	Rooms 25 and more and less than 50	Rooms 50 and more	Total			
LC	1990	...	...	...	...	...	5,239	2,370	70.8
	1995	...	...	...	...	...	7,423	3,974	73.2
	1998	...	...	...	...	...	7,705	4,077	75.3
	1999	...	...	...	...	...	7,768	4,125	72.5
	2000	...	...	...	...	...	8,236	4,428	67.0
	2001	...	...	...	...	...	8,236	4,428	57.0
	2002	...	...	...	...	...	8,236	4,428	56.1
	2003	...	...	...	...	...	6,748	3,749	58.8
	2004	31	37	16	51	135	7,153	3,974	64.8
TT	1990	...	...	...	...	42	...	...	52.9
	1995	...	...	...	...	69	...	...	50.3
	1998	...	...	...	...	87	...	...	55.7
	1999	...	...	...	...	108	...	...	61.2
	2000	...	...	...	...	113	...	...	52.2
	2001	...	...	...	...	118	...	...	43.0
	2002	...	...	...	...	106	...	...	41.0
	2003	...	...	...	...	119	...	...	44.5
	2004	...	...	...	...	117	...	...	...
ASSOCIATE MEMBERS									
BM	1999	...	...	...	...	...	7,383	...	59.6
	2000	...	...	...	...	...	6,557	...	61.6
	2001	...	...	...	...	...	7,915	...	51.9
	2002	...	...	...	...	...	6,523	...	55.0
	2003	...	...	...	...	...	6,293	...	54.5
VG	1995	...	...	...	...	...	...	...	56.4
	1998	...	...	...	...	...	...	...	61.4
	1999	...	...	...	...	...	...	...	57.3
	2000	...	...	...	...	...	...	...	63.2
	2001	...	...	...	...	...	...	...	59.9
	2002	...	...	...	...	...	...	...	61.4
	2003	...	...	...	...	...	...	...	66.8
	2004e	...	...	...	...	...	...	...	67.1
TC	1990	3	7	2	4	16	1,659	...	...
	1995	4	10	2	3	19	1,278	...	...
	1998	6	12	4	4	26	2,336	...	...
	1999	6	13	5	7	31	2,928	...	...
	2000	7	12	5	7	31	2,903	...	...
	2001	7	12	6	8	33	2,993	...	58.0
	2002	8	14	6	9	37	3,416	...	51.0
	2003	7	14	6	9	36	3,402	...	57.0
	2004	6	15	7	10	38	3,743	...	55.0



TOR3: VISITOR EXPENDITURE**DK****Concept and Definition**

Tourism (Visitor) Expenditure is the total consumption expenditure made by a visitor, or on behalf of a visitor, for and during his or her trip and stay at a specific country destination. Total tourism expenditure can be broken down into:

- International and domestic tourism expenditure;
- Expenditures on same-day visits and overnight stays; and,
- Expenditure on accommodations, meals and drinks, shopping, entertainment, etc.

Tourism (Visitor) Expenditure encompasses a wide variety of items, ranging from the purchase of consumer goods and services inherent in travel and stays to the purchase of small durable goods for personal use and souvenirs and gifts for family and friends. Tourism expenditure is not restricted to payments made during the visit. It also includes advance or outlays necessary for the preparation and undertaking of the trip and travel-related purchases made in the place of residence after returning from a trip. These categories refer to payments for travel insurance, transport, the purchase of travel guides, etc.

There are certain types of outlays or acquisitions which are excluded from tourism expenditure. These are purchases for commercial purposes, capital-type investments, transactions (e.g. real estate, cars, boats, etc.), even if they may in the future be used for tourism purposes, and cash or donations made to private persons or institutions which do not represent payment for tourism goods or services.

(Please refer to the Eurostat, Statistical Office of the European Communities website)

Types of Expenditures

International tourism expenditures are defined as expenditures of outbound visitors in other countries, including their payments to foreign carriers for international transport. They should also include any other pre- or post- payments for goods and services purchased from the countries visited.

Domestic tourism expenditures are defined as expenditures incurred as a direct result of resident visitors travelling within their own country of residence.

Expenditures on same day/overnight visits are defined as the expenditures of visitors who spend less than twenty-four hours in the country being visited.

Method of Computation

Barbados: Using the assumption that the tourist staying in recognized accommodation spends 55 per cent of his/her total expenditure in Barbados on room and board, the figures are grossed up by 45 per cent to give a total expenditure of tourists staying in recognized accommodation. Tourists in private and unrecognized accommodation are subdivided in the following three categories: (i) those staying in rented apartments/cottages (ii) those staying with friends/relatives or in their own homes and (iii) others. Tourist nights spent by these three groups are multiplied by daily expenditure for the corresponding groups to give expenditure in private and unrecognized accommodation.

Other Member States and Associate Members: Data was collected from Tourism Surveys conducted.

Indicator Relevance

Data on visitor expenditure give an indication of the impact of tourism on an economy. Expenditure on accommodation, meals and drinks, shopping, entertainment, etc. also gives an indication of the demand on existing goods and services within the economy. Moreover, data on visitor expenditure answer the following questions:

- How much wealth is transferred to destinations?
- What is the contribution of tourism to the economy?
- How does tourism relate to other sectors?

Visitor expenditure can also be used for application in:

- Calculations of Consumer Price Indices (CPI) and derived “Tourism Price Indices”;
- Welfare analysis;
- National accounts;
- Other type of analysis; and,
- Consumer demand and market research.

Data Assessment

The Bahamas, The British Virgin Islands and The Turks and Caicos Islands provided the definitions that were used in the compilation of total visitor expenditure. The definitions provided are in accordance with the international definition. These countries did not, however, provide the criteria that were used to determine the types of expenditure that would count as visitor expenditure. It is therefore difficult to assess the degree of harmonization of this indicator.

Data Sources

Please refer to the similar section in indicator TOR1(a)

Evaluation

Estimated visitor expenditure for ten Member States and four Associate Members is summarised in **Table 2.3**. It can be seen that The Bahamas, Barbados and Jamaica were the major earners from tourism averaging more than US\$1 billion for the period of data except for 1990 in the case of Barbados. International and Domestic tourists accounted for 99 per cent of total expenditure in The Bahamas and Expenditure on accommodation, meals and drinks, shopping, entertainment etc averaged US\$1.5 billion with some fluctuations during the period for this Member State. Tourist expenditure in Jamaica and Barbados increased significantly since 1990 with few periods of declines most notably in 2001 and 2002.

Among Associate Members, The British Virgin Islands and Bermuda averaged more than US\$325 million for the period 2001 to 2004. Visitor expenditure in Bermuda was US\$353.7 million in 2004 while the estimate for The British Virgin Islands was US\$391.3 million for the same year.

Visitor Expenditure in Belize showed a steady increase throughout the period from US\$44.5 million in 1990 to US\$172.7 million in 2004. Data for Saint Lucia also revealed significant increases with few periods of declines in 1999, 2001 and 2002 in Visitor Expenditure revealing not only increase in visitors to the island but opportunities for visitors to spend while on the island. Visitor Expenditure in this Member State increased from US\$152.9 million in 1990 to US\$263.1 million in 1995 and averaged US\$267.8 million over the period 1998 to 2003.

Estimated visitor expenditure in Montserrat declined by 37 per cent from US\$4.1 million in 1990 to US\$2.6 million in 1995 due to volcano activity within the island. In St. Kitts and Nevis, increases and declines in visitor expenditure were equal for reporting years with average earnings estimated at US\$65 million for 1995 and 1998 to 2004. St. Vincent and the Grenadines reported overall increases in visitor expenditure which averaged US\$86.7 million from 1998 to 2004. Trinidad and Tobago's visitor expenditure moved from US\$72.6 million in 1995 to US\$242 million in 2002, declining only once in 2001. For the period 1995 to 1998 visitor expenditure on accommodation, meals and drinks, shopping, entertainment etc in Grenada increased by 30.7 per cent from US\$53 million in 1995. From 1998, expenditure increased to US\$162.2 million in 1999 then to US\$172.6 million in 2000 and declined by 8.3 per cent in 2001 after which it increased to US\$169.5 million in 2002 and further to US\$169.5 in 2003 before declining once more in 2004 due to Hurricanes.

Data on the number of workers directly employed in tourism is also given in **Table 2.3** for Belize, Grenada, Anguilla and The Turks and Caicos Islands along with Jamaica and Bermuda for which totals were provided. The number of persons employed in the industry in Jamaica averaged 30,000 during the period 1995 to 2004 after recording 20,561 persons employed in the industry in 1990. In 1998, the Tourism sector provided employment to 1,974 persons in Grenada of which 61 per cent or 1,195 were women.

Belize supplied data for 1995 and 1998 to 2004 which shows an overall increase in the number of persons employed in tourism sector from 2,107 persons in 1995 to 3,770

persons in 2004 an increase of 79 per cent. The proportion of women employed in the sector declined from 55.3 per cent in 1995 to 49.8 per cent in 2003 and increased to 49.9 per cent in 2004.

From 2001 to 2004 an average 2,923 persons were employed in the tourism industry in Bermuda. Bermuda also saw overall declines during the period from 3,670 in 2001 to 2,191 in 2004. In Anguilla, the number of persons employed in this sector was 11.4 per cent higher in 2001 compared to the 1999 figure of 1,425 and the proportion of women increased from 57 per cent in 1999 to 60 per cent in 2001. The Turks and Caicos Islands reported 2,368 persons employed in tourism comprising 1,126 women in 2001.

**Table 2.3 Visitor expenditure and Number Employed in Tourism:
1990, 1995, 1998-2004**

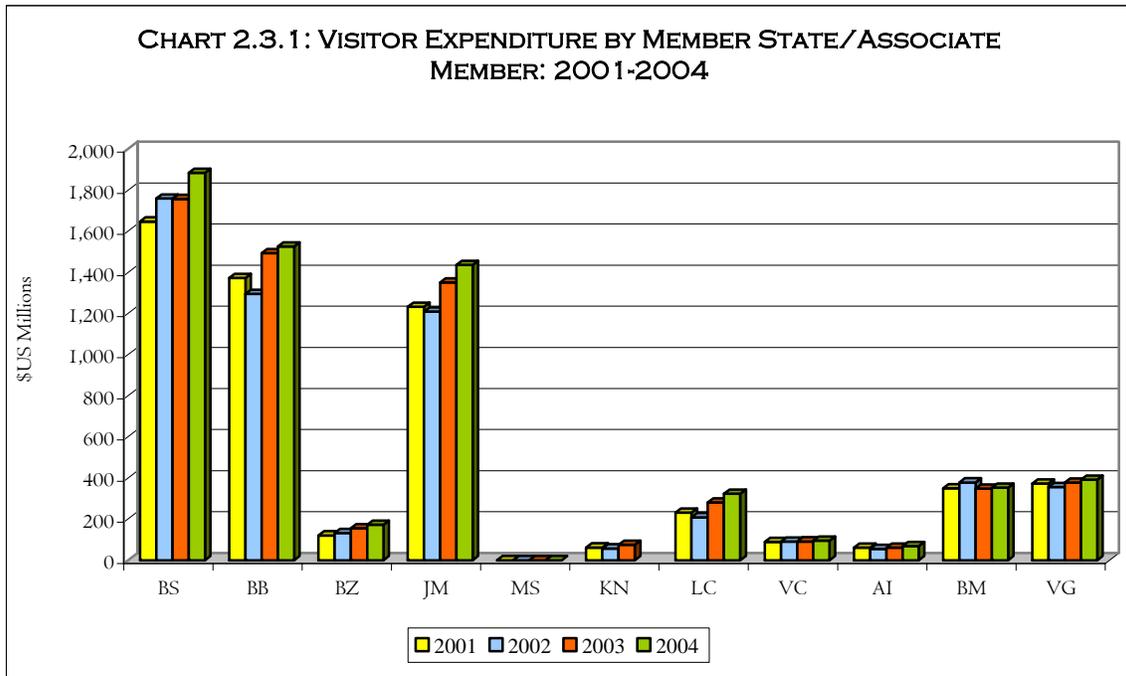
Country	Year	Visitor expenditure ('000US\$)	Int'l and domestic tourism expenditure ('000US\$)	Expenditure on same-day visits ('000US\$)	Expenditure on accommodation, meals and drinks, shopping, entertainment etc. ('000US\$)	Total directly employed in tourism		
						Women	Men	Total
BS	1990	1,332,950	1,320,500	12,470	1,209,930	...	...	...
	1995	1,346,150	1,341,100	5,050	1,245,390	...	...	...
	1998	1,354,060	1,350,000	4,090	1,244,400	...	...	...
	1999	1,582,930	1,578,500	4,440	1,463,600	...	...	...
	2000	1,734,500	1,727,700	6,750	1,579,750	...	...	...
	2001	1,647,680	1,642,400	5,290	1,494,810	...	...	...
	2002	1,759,800	1,753,800	6,020	1,602,550	...	...	...
	2003	1,757,380	1,752,400	5,040	1,595,340	...	...	...
	2004	1,884,480	1,879,300	5,180	1,693,490	...	...	...
BB	1990	987,004	...	...	...	...	...	...
	1995	1,359,035	...	...	...	...	...	...
	1998	1,405,944	...	...	...	...	...	...
	1999	1,332,427	...	...	...	...	...	...
	2000	1,422,631	...	...	...	...	...	...
	2001	1,373,518	...	...	...	...	...	...
	2002	1,295,655	...	...	...	...	...	...
	2003	1,493,760	...	...	...	...	...	...
	2004	1,526,341	...	...	...	...	...	...
BZ	1990	44,500	...	...	...	...	...	...
	1995	77,100	...	...	...	1,166	941	2,107
	1998	108,300	...	...	...	1,180	1,023	2,203
	1999	111,500	...	...	...	1,385	1,185	2,570
	2000	120,200	...	...	...	1,494	1,275	2,769
	2001	120,500	...	...	...	1,538	1,396	2,934
	2002	132,800	...	...	...	1,531	1,543	3,074
	2003	155,700	...	...	...	1,717	1,730	3,447
	2004	172,700	...	...	...	1,884	1,886	3,770
GD	1995	...	...	4,581	53,022	...	...	...
	1998	...	...	7,878	145,942	1,195	779	1,974
	1999	...	...	7,273	162,195	...	...	...
	2000	...	...	5,342	172,608	...	...	...
	2001	...	...	4,367	158,203	...	...	...
	2002	...	...	4,002	169,508	...	...	...
	2003	...	...	4,353	169,541	...	...	...
	2004	...	...	6,809	147,918	...	...	...
JM	1990	740,000	...	...	...	...	...	20,561
	1995	1,068,500	...	...	...	...	...	27,937
	1998	1,197,140	...	...	...	...	...	30,131
	1999	1,279,532	...	...	...	...	...	30,325
	2000	1,332,597	...	...	...	...	...	31,080
	2001	1,232,960	...	...	...	...	...	29,142
	2002	1,209,484	...	...	...	...	...	30,434
	2003	1,351,142	...	...	...	...	...	30,512
	2004	1,436,577	...	...	...	...	...	30,999

**Table 2.3 Contd. Visitor expenditure and Number Employed in Tourism:
1990, 1995, 1998-2004**

Country	Year	Visitor expenditure ('000US\$)	Int'l and domestic tourism expenditure ('000US\$)	Expenditure on same-day visits ('000US\$)	Expenditure on accommodation, meals and drinks, shopping, entertainment etc. ('000US\$)	Total directly employed in tourism		
						Women	Men	Total
MS	1990	4,143	...	...	...	...	...
	1995	2,606	...	...	...	...	...
	1998	2,963	...	...	...	...	...
	1999	3,073	...	...	...	...	...
	2000	3,320	...	...	...	...	...
	2001	3,141	...	...	...	...	...
	2002	3,237	...	...	...	...	...
	2003	2,716	...	...	...	...	...
	2004	3,402	...	...	...	...	...
KN	1995	63,037	...	...	...	...	...
	1998	76,315	...	...	...	...	...
	1999	67,426	...	...	...	...	...
	2000	58,444	...	...	...	...	...
	2001	61,852	...	...	...	...	...
	2002	57,148	...	...	...	...	...
	2003	75,333	...	...	...	...	...
LC	1990	152,900	...	...	...	...	...
	1995	263,170	...	...	...	...	...
	1998	281,600	...	...	...	...	...
	1999	272,370	...	...	...	...	...
	2000	276,790	...	...	...	...	...
	2001	231,500	...	...	...	...	...
	2002	208,700	...	...	...	...	...
	2003	280,500	...	...	...	...	...
	2004	323,500	...	...	...	...	...
VC	1995	52,890	...	...	...	...	...
	1998	73,340	...	...	...	...	...
	1999	84,570	...	...	...	...	...
	2000	82,280	...	...	...	...	...
	2001	89,010	...	...	...	...	...
	2002	91,010	...	...	...	...	...
	2003	91,190	...	...	...	...	...
	2004	95,550	...	...	...	...	...
TT	1995	...	72,600	...	72,600	...	...
	1998	...	201,200	...	201,200	...	...
	1999	...	209,600	...	209,600	...	...
	2000	...	212,800	...	212,800	...	...
	2001	...	200,900	...	200,900	...	...
	2002	...	242,000	...	242,000	...	...

**Table 2.3 Contd. Visitor expenditure and Number Employed in Tourism:
1990, 1995, 1998-2004**

Country	Year	Visitor expenditure ('000US\$)	Int'l and domestic tourism expenditure ('000US\$)	Expenditure on same-day visits ('000US\$)	Expenditure on accommodation, meals and drinks, shopping, entertainment etc. ('000US\$)	Total directly employed in tourism		
						Women	Men	Total
ASSOCIATE MEMBERS								
AI	1995	48,500	45,600	2,900	...	...	...	...
	1998	57,200	54,100	3,100	...	...	...	...
	1999	56,200	53,400	2,800	...	808	617	1,425
	2000	55,200	52,100	3,100	...	...	...	...
	2001	61,000	58,300	2,700	...	956	631	1,587
	2002	55,300	51,590	3,710	...	...	...	...
	2003	61,653	58,022	3,631	...	...	...	...
	2004	69,100	65,200	3,900	...	...	...	...
BM	2001	349,700	...	...	349,700	...	...	3,670
	2002	378,800	...	...	378,800	...	...	3,563
	2003	347,900	...	...	347,900	...	...	2,266
	2004	353,700	...	...	353,700	...	...	2,191
VG	1995	183,180	...	11,630	171,550	...	...	...
	1998	286,330	...	10,390	275,940	...	...	...
	1999	311,520	...	17,050	294,470	...	...	...
	2000	386,030	...	20,780	365,250	...	...	...
	2001	400,770	...	21,670	379,100	...	...	...
	2002	344,550	...	23,860	320,690	...	...	...
	2003	341,950	...	32,120	309,830	...	...	...
	2004e	407,110	...	48,800	358,310	...	...	...
TC	2001	...	...	...	...	1,126	1,242	2,368
	2002	...	...	...	271,600	...	...	...
	2004	...	...	...	314,900	...	...	...



TOR4: TOURIST ARRIVALS BY TYPE OF ACCOMMODATION**PH****Concept and Definition**

Tourist Arrivals include all stay-over visitors. It does not, however, include cruise passenger and yacht arrivals.

Tourist accommodation refers to any facility that regularly or occasionally provides overnight accommodation for tourists. There are two basic categories of tourist accommodations:

- *Collective accommodation establishments*: e.g. Hotels and similar establishments; and,
- *Private tourist accommodations*: e.g. owned dwellings, rented rooms in family homes, accommodation provided by friends and relatives. (*Please refer to the Caribbean Tourism Statistical Report 2002-2003 (2004) pg. 299.*)

Types of Accommodation Establishments

Hotels: Hotels and similar establishments are typified as being arranged in rooms, in number exceeding a specified minimum; as coming under a common management; as providing certain services including room service, daily bed-making and cleaning of sanitary facilities; as grouped in classes and categories according to the facilities and services provided; and as not falling in the category of specialised establishments. Hotels comprise: Commercial hotels, apartment hotels, motels, roadside inns, beach hotels, residential clubs and similar establishments providing accommodation services, including more than daily bed-making and cleaning of the room and sanitary facilities.

Apartments/Villas: These are self-contained private dwellings in a single or multi-storied building with separate and direct access to the street or a communal staircase, passage, veranda, gallery, etc.

Guest Houses: Guest houses are hotels with fewer than ten rooms.

Cottage: Cottages are small single- storied houses that act as a vacation house, usually in the country.

Yacht: A yacht is a small sailing or motor-driven vessel used for pleasure cruises or racing.

Private Home: Private homes include accommodation at privately owned residences, as well as holiday-furnished premises.

Other: This category refers to accommodation establishments not so far mentioned.

Method of Computation

Embarkation/disembarkation (E/D) cards were analyzed to gather data for this indicator. These E/D cards are completed for the various immigration authorities, as part of the frontier formalities, by visitors on arrival at the port of entry at the destination countries.

Indicator Relevance

Data on tourist arrivals by accommodation indicate tourism hotspots and pressures on the environment linked to land use and resources, as well as travel levels.

Tourist accommodations are known to generate higher amounts of solid waste on a per capita basis than nationals. Moreover, energy consumption is boosted by the tourist sector as accommodation and other attractions are large consumers of energy. Most of the Caribbean countries are reliant upon the importation of non-renewable fossil fuels as a source of energy. Other environmental impacts arise from the construction of infrastructure (hotels, marinas, transport links, waste treatment facilities, groynes, etc) and from recreational facilities (golf courses, water sports, etc) for tourists.

In addition, tourist accommodations are large consumers of fresh water-water is often used excessively for drinking, showers, laundry, swimming pools, maintenance of golf courses, etc. This is a problem on islands which are already densely populated. Supply shortages may lead to health risks if the water quality diminishes due to raw or improperly treated sewage or the run-off from showers, laundries and kitchen sink disposals.

Tourist arrivals by type of accommodation also gives an indication of the level of waterfront vacationing. This is especially important because waterfront vacationing tends to have negative impacts on the environment. Some of these negative impacts are beach and dune erosion, inadequate wastewater treatment, over-fishing and depriving access by local communities to traditional fishing grounds and recreational areas. An indication of the level of waterfront vacationing is also important because it gives an indication of the possible solutions that can be used to combat its negative effects. Solutions may include evaluating and classifying coastal areas according to ecological, social and cultural sensitivity and determining an area's level of tourist activity according to its carrying capacity. *(Please refer to the Earth Negotiations Bulletin website at <http://www.iisd.ca/vol05/enb05125e.html>.)*

Data Assessment

Of the ten reporting countries, eight countries provided data for at least five of the nine years for which data was collected. The two exceptions were Grenada, which provided data for three years, and Montserrat, which provided data for four years. Most of the reporting Member States and Associate Members provided data for 'tourist arrivals by type of accommodation' with the exception of Bermuda, which reported 'visitor arrivals by type of accommodation'. This indicator is partially harmonized within the Region.

It was assumed that the concept of tourist accommodations is in accordance with the international definition and is harmonized across the region since no definition was provided by the reporting Member States and Associate Members.

Data Sources

Please refer to the similar section in indicator TOR1(a).

Evaluation

Table 2.4 (a) presents data on tourist arrival by type of accommodation for seven (7) Member States and three (3) Associate Members. While *hotels* were the popular choice for visitors to The Bahamas, Saint Lucia, The Turks and Caicos Islands and Bermuda, more than 60 per cent of tourists to other Member states preferred *other accommodation* such as villas, apartments, cottages, yachts or private accommodation.

Tourists who were reported under the category *other accommodation* accounted for a significant proportion of total tourist arrivals in Suriname and Trinidad and Tobago although there were marked declines towards the end of the period for both countries.

In The Bahamas, *hotel* accommodation from the year 2000 onwards averaged 1.1 million tourists per annum. *Hotel* accommodation saw a decline by 1.6 per cent in 2002 from 73.4 per cent in 2001 while accommodation in *cottages*, *yachts* and *private homes* increased by 3.5 per cent from 8.8 per cent in 2001. *Hotel* visitors recovered towards the end of the period, increasing by 2 per cent.

Hotel accommodations in Saint Lucia increased throughout the period except for a marked decline in 2002 by 14 per cent. Data for Bermuda revealed steady declines since 1999, although the number of non-resident air and sea arrivals grew throughout the period, with visitors preferring accommodations such as *cottages*, *yachts* and *private homes*.

Except for a slight dip in 1999 and 2002, the number of tourists accommodated in *hotels* in The Turks and Caicos Islands has been steadily increasing.

Although tourists arrivals in Montserrat was reportedly less than all other countries averaging 9,547 during the period 2001 to 2004, 77.5 per cent preferred private homes rather than *hotels*, *guest houses* or *apartments*. Saint Lucia, St. Vincent and the Grenadines and The British Virgin Islands also reported data with a similar trend of increased preference for *cottages*, *yachts* and *private homes* by tourists.

Table 2.4 (a) Number of Tourist Arrivals by Types of Accommodation: 1990, 1995, 1998-2005

Country	Year	Hotels	Apartments /Villas	Guest Houses	Cottages/ Yacht/ Private Home	Other	Total
BS	2000	1,138,154	38,021	0	142,140	225,644	1,543,959
	2001	1,128,415	42,127	0	135,267	231,971	1,537,780
	2002	1,085,907	36,192	0	185,788	205,264	1,513,151
	2003	1,098,185	38,619	0	120,080	253,285	1,510,169
	2004	1,152,068	49,971	0	133,719	225,554	1,561,312
GD	2002	47,951	9,702	3,884	70,879	0	132,416
	2003	54,201	11,338	4,619	63,660	8,537	142,355
	2004	45,325	11,894	3,894	63,331	9,421	133,865
MS	2001	923	617	372	7,555	355	9,822
	2002	831	356	763	7,382	504	9,836
	2003	736	292	243	6,623	496	8,390
	2004	1,020	522	180	8,032	384	10,138
LC	1990	93,017	4,048	6,672	27,265	9,985	140,987
	1995	163,340	11,924	6,521	29,267	20,207	231,259
	1998	182,261	6,796	13,948	29,467	19,765	252,237
	1999	189,357	12,019	8,763	31,907	21,747	263,793
	2000	204,389	6,924	8,562	28,283	21,692	269,850
	2001	183,248	8,185	10,026	26,431	22,242	250,132
	2002	150,463	5,171	2,568	42,898	52,363	253,463
	2003	194,518	5,300	3,779	33,982	39,369	276,948
	2004	211,916	9,448	5,510	38,256	33,301	298,431
VC	1998	11,505	1,466	401	31,400	22,456	67,228
	1999	11,745	1,083	335	29,607	25,523	68,293
	2002	20,950	5,824	1,074	44,625	5,158	77,631
	2003	14,162	11,206	887	36,408	15,872	78,535
	2004	13,600	13,578	990	38,266	20,287	86,721
	2005	14,622	14,819	1,393	41,317	23,354	95,505
SR	1995	1,455	0	0	0	41,987	43,442
	1998	3,817	0	535	0	50,233	54,585
	1999	4,184	0	565	0	52,526	57,275
	2000	4,330	0	564	0	51,949	56,843
	2001	6,153	0	527	0	47,661	54,341
	2002	6,022	0	602	0	53,599	60,223
	2003	23,043	0	4,116	0	55,139	82,298
	2004	22,728	0	5,678	0	46,481	74,887
	2004*	41,877	0	10,454	0	85,711	138,042
	2005*	51,069	0	12,910	0	96,043	160,022

Table 2.4 (a) Contd. Number of Tourist Arrivals by Types of Accommodation: 1990, 1995, 1998-2005

Country	Year	Hotels	Apartments /Villas	Guest Houses	Cottages/ Yacht/ Private Home	Other	Total
TT	1990	32,306	0	2,452	0	159,763	194,521
	1995	35,627	0	11,468	0	212,689	259,784
	1998	57,045	0	16,697	0	260,295	334,037
	1999	53,658	0	23,267	0	281,268	358,193
	2000	52,487	0	25,812	0	320,260	398,559
	2001	57,074	0	23,739	0	302,288	383,101
	2002	89,127	11,968	17,339	0	265,780	384,214
	2003	103,673	12,470	21,671	0	271,257	409,071
	2004	110,117	10,935	19,855	0	301,689	442,596
	ASSOCIATE MEMBERS						
BM*	1990	331,581	...	8,859	...	92,266	432,706
	1995	301,423	...	3,043	...	83,090	387,556
	1998	288,553	...	2,235	...	77,968	368,756
	1999	270,451	...	2,726	...	80,849	354,026
	2000	239,412	...	2,422	...	86,471	328,305
	2001	193,606	...	2,390	...	79,013	275,009
	2002	205,383	...	2,329	...	75,845	283,557
	2003	182,021	...	1,148	...	73,407	256,576
	2004	187,880	...	2,844	...	80,897	271,621
	VG	1995	76,251	0	0	129,553	13,706	219,510
1998		65,437	0	0	175,077	27,201	267,715
1999		74,888	0	0	182,238	28,733	285,858
2000		77,412	0	0	182,605	21,102	281,119
2001		73,714	0	0	202,154	19,757	295,625
2002		57,790	0	0	201,166	22,740	281,696
2003		60,299	0	0	233,768	23,691	317,758
2004e		85,092	0	0	191,116	27,548	303,756
TC	1990	...	...	...	...	...	48,756
	1995	59,066	0	1,272	...	18,619	78,957
	1998	74,505	0	989	...	35,361	110,855
	1999	74,381	0	1,123	...	45,394	120,898
	2000	87,379	28,439	728	...	34,826	151,372
	2001	104,043	34,061	1,036	...	26,696	165,836
	2002	100,944	30,695	996	...	22,326	154,961
	2003	102,141	37,551	1,045	...	23,363	164,100
	2004	...	...	...	...	...	173,081

*Non-resident Air and Sea arrivals

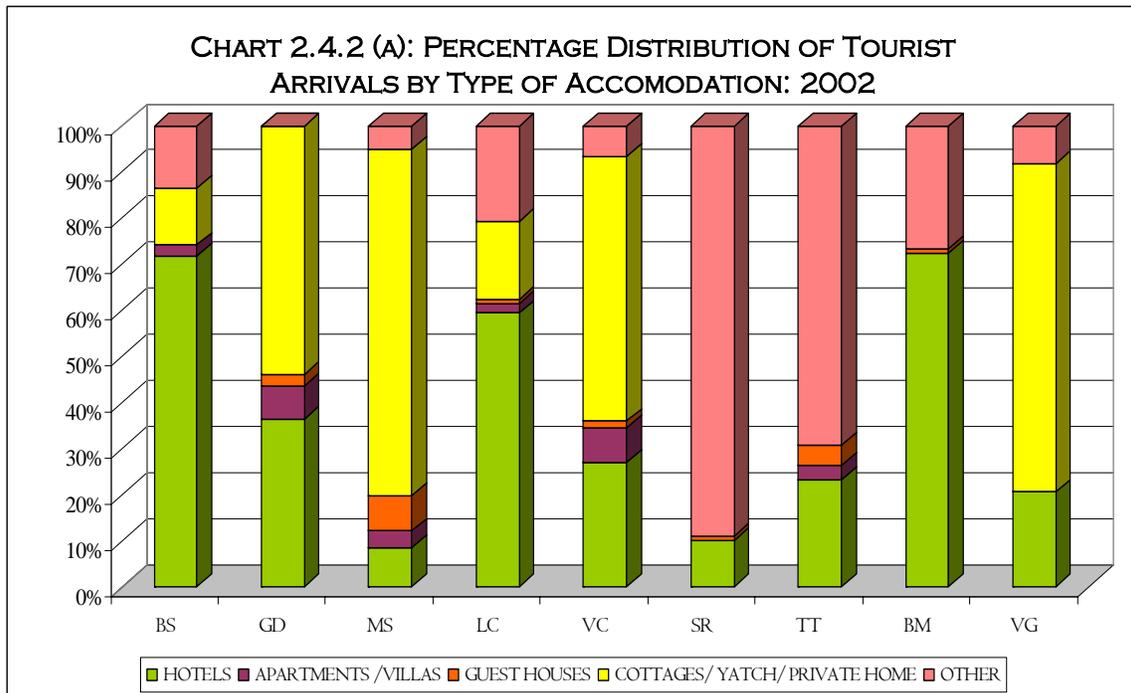
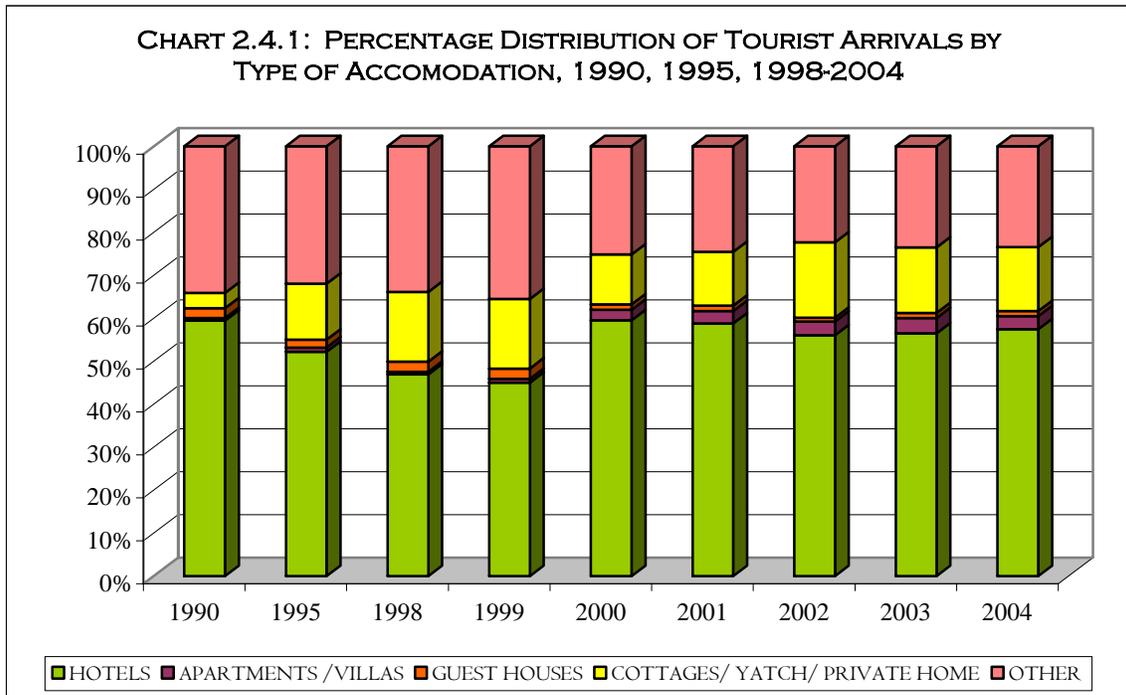
Table 2.4 (b) Percentage Distribution of Tourist Arrivals by Types of Accommodation: 1990, 1995, 1998-2005

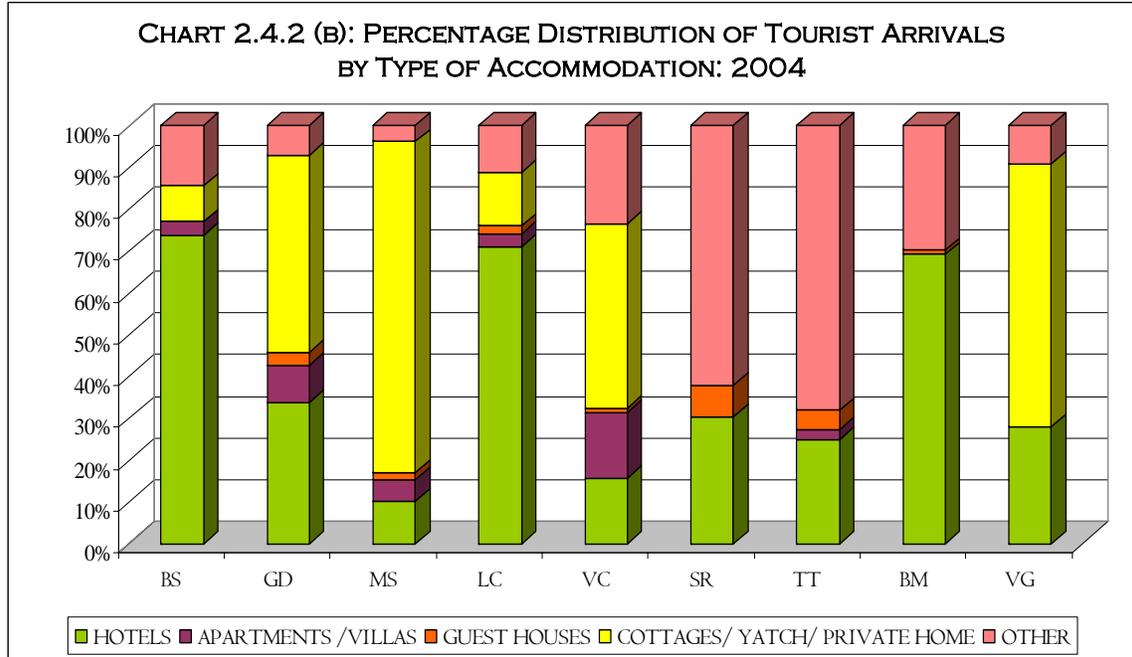
Country	Year	Hotels	Apartments /Villas	Guest Houses	Cottages/ Yacht/ Private Home	Other	Total
BS	2000	73.7	2.5	0.0	9.2	14.6	100.0
	2001	73.4	2.7	0.0	8.8	15.1	100.0
	2002	71.8	2.4	0.0	12.3	13.6	100.0
	2003	72.7	2.6	0.0	8.0	16.8	100.0
	2004	73.8	3.2	0.0	8.6	14.4	100.0
GD	2002	36.2	7.3	2.9	53.5	0.0	100.0
	2003	38.1	8.0	3.2	44.7	6.0	100.0
	2004	33.9	8.9	2.9	47.3	7.0	100.0
MS	2001	9.4	6.3	3.8	76.9	3.6	100.0
	2002	8.4	3.6	7.8	75.1	5.1	100.0
	2003	8.8	3.5	2.9	78.9	5.9	100.0
	2004	10.1	5.1	1.8	79.2	3.8	100.0
LC	1990	66.0	2.9	4.7	19.3	7.1	100.0
	1995	70.6	5.2	2.8	12.7	8.7	100.0
	1998	72.3	2.7	5.5	11.7	7.8	100.0
	1999	71.8	4.6	3.3	12.1	8.2	100.0
	2000	75.7	2.6	3.2	10.5	8.0	100.0
	2001	73.3	3.3	4.0	10.6	8.9	100.0
	2002	59.4	2.0	1.0	16.9	20.7	100.0
	2003	70.2	1.9	1.4	12.3	14.2	100.0
	2004	71.0	3.2	1.8	12.8	11.2	100.0
VC	1998	17.1	2.2	0.6	46.7	33.4	100.0
	1999	17.2	1.6	0.5	43.4	37.4	100.0
	2002	27.0	7.5	1.4	57.5	6.6	100.0
	2003	18.0	14.3	1.1	46.4	20.2	100.0
	2004	15.7	15.7	1.1	44.1	23.4	100.0
	2005	15.3	15.5	1.5	43.3	24.5	100.0
SR	1995	3.3	0.0	0.0	0.0	96.7	100.0
	1998	7.0	0.0	1.0	0.0	92.0	100.0
	1999	7.3	0.0	1.0	0.0	91.7	100.0
	2000	7.6	0.0	1.0	0.0	91.4	100.0
	2001	11.3	0.0	1.0	0.0	87.7	100.0
	2002	10.0	0.0	1.0	0.0	89.0	100.0
	2003	28.0	0.0	5.0	0.0	67.0	100.0
	2004	30.3	0.0	7.6	0.0	62.1	100.0
	2004*	30.3	0.0	7.6	0.0	62.1	100.0
	2005*	31.9	0.0	8.1	0.0	60.0	100.0

**Table 2.4 (b) Contd. Percentage Distribution of Tourist Arrivals by Types of Accommodation:
1990, 1995, 1998-2005**

Country	Year	Hotels	Apartments /Villas	Guest Houses	Cottages/ Yacht/ Private Home	Other	Total
TT	1990	16.6	0.0	1.3	0.0	82.1	100.0
	1995	13.7	0.0	4.4	0.0	81.9	100.0
	1998	17.1	0.0	5.0	0.0	77.9	100.0
	1999	15.0	0.0	6.5	0.0	78.5	100.0
	2000	13.2	0.0	6.5	0.0	80.4	100.0
	2001	14.9	0.0	6.2	0.0	78.9	100.0
	2002	23.2	3.1	4.5	0.0	69.2	100.0
	2003	25.3	3.0	5.3	0.0	66.3	100.0
	2004	24.9	2.5	4.5	0.0	68.2	100.0
	ASSOCIATE MEMBERS						
BM*	1990	76.6	0.0	2.0	0.0	21.3	100.0
	1995	77.8	0.0	0.8	0.0	21.4	100.0
	1998	78.3	0.0	0.6	0.0	21.1	100.0
	1999	76.4	0.0	0.8	0.0	22.8	100.0
	2000	72.9	0.0	0.7	0.0	26.3	100.0
	2001	70.4	0.0	0.9	0.0	28.7	100.0
	2002	72.4	0.0	0.8	0.0	26.7	100.0
	2003	70.9	0.0	0.4	0.0	28.6	100.0
	2004	69.2	0.0	1.0	0.0	29.8	100.0
	VG	1995	34.7	0.0	0.0	59.0	6.2	100.0
1998		24.4	0.0	0.0	65.4	10.2	100.0
1999		26.2	0.0	0.0	63.8	10.1	100.0
2000		27.5	0.0	0.0	65.0	7.5	100.0
2001		24.9	0.0	0.0	68.4	6.7	100.0
2002		20.5	0.0	0.0	71.4	8.1	100.0
2003		19.0	0.0	0.0	73.6	7.5	100.0
2004e		28.0	0.0	0.0	62.9	9.1	100.0
TC	1995	74.8	0.0	1.6	0.0	23.6	100.0
	1998	67.2	0.0	0.9	0.0	31.9	100.0
	1999	61.5	0.0	0.9	0.0	37.5	100.0
	2000	57.7	18.8	0.5	0.0	23.0	100.0
	2001	62.7	20.5	0.6	0.0	16.1	100.0
	2002	65.1	19.8	0.6	0.0	14.4	100.0
	2003	62.2	22.9	0.6	0.0	14.2	100.0

*Non-resident Air and Sea arrivals





TOR5: TOURIST ARRIVALS BY COUNTRY OF ORIGIN**PH****Concept and Definition**

Tourist Arrivals include all stay-over visitors. It does not, however, include cruise passengers and yacht arrivals.

Country of Origin: This is the place/country from which the trip originates. It is usually the same as the place and country of residence.

The trip may also start from the place of work or education. This is not relevant for tourism since the place of residence may still be considered as the origin. When people live in another place than their usual residence during the survey period (e.g. short-term migrants and seasonal workers), this place should be taken as the origin. For day trips the place of origin may be the second regular residence of the person although it is useful to distinguish them from trips originating from the first residence.

Country of Residence: A person is considered to be a resident in a country (place) if the person (i) has lived for most of the past year or 12 months in that country (place), or (ii) has lived in that country (place) for a shorter period and intends to return within 12 months to live in that country (place).

Method of Computation

Embarkation/disembarkation (E/D) cards were analyzed to gather data for the country of origin of tourists. These E/D cards are completed for the various immigration authorities, as part of the frontier formalities, by visitors on arrival at the port of entry at the destination countries.

Indicator Relevance

Tourism in the Caribbean attracts a lot of international visitors rather than domestic visitors. As such, transport by air is continuously increasing in response to the rising number of tourists. One consequence of this increase in air travel is that tourism is responsible for an important share of greenhouse gas emissions since air travel involves the production of carbon dioxide. In fact, it is estimated that a single transatlantic return flight emits almost half the carbon dioxide produced by all other sources (lighting, heating, car use, etc.) consumed by an average person yearly.

Data Assessment

St. Vincent and the Grenadines followed the internationally recommended definition and used the country of residence to determine the country of origin. Grenada and Suriname, on the other hand, used nationality to determine the country of origin. None of the other reporting Member States and Associate Members specified whether the country of origin

referred to the country of residence or the country last visited. It was, therefore, assumed that the internationally recommended definition was followed.

Furthermore, most of the reporting Member States and Associate Members provided data for ‘tourist arrivals by country of origin’ with the exception of Bermuda, who reported ‘visitor arrivals by country of origin’. This indicator is partially harmonized within the Region.

Data Sources

Please refer to the similar section in indicator TOR1(a).

Evaluation

The data presented in **Table 2.5 (b)** and **Appendix 1.2 Table 1 (a)** shows that the United States and the United Kingdom and Europe accounted for more than fifty per cent of all tourist arrivals to the Region with the exception of Dominica and Montserrat where a greater percentage of non-resident (stopover) arrivals were from the Caribbean Region (See **Appendix 1.2 Table 1 (a)**).

In 2004 tourist arrivals to the Region increased by 19.6 per cent or a total of 95,505 visitors when compared to the 1998 figure of 3,163,887. During the period 1998 to 2004, the year 2001 saw a greater decline in the number of visitors, 155,655 visitors from 5,633,632 recorded in 2000, of which the United Kingdom and Europe accounted for 34.1 per cent, the United States 17.8 per cent and Canada 13 per cent.

The United States market continued to be dominant in The Bahamas with an average 1.3 million tourists during the years 1990, 1995 and 1998 to 2004 representing an average of 85 per cent of total visitors to the island. Out of a total of 1.56 million tourists to The Bahamas in 1990, 6.2 per cent or 96,625 were from Europe and this per cent fluctuated during the years 1990, 1995 and 1998 to 2004 peaking in 1999 at 8 per cent or 125,485 visitors and subsequently declining to 5.4 per cent or 83,590. Tourist arrivals from Canada declined for years from 96,755 visitors in 1990 to 68,462 in 2004.

Tourist arrivals from the United States to Barbados registered 33.2 per cent of total arrivals in 1990 and declined by 9.7 per cent toward the end of the period. There were significant increases in the European Market which increased its share from 34.2 per cent in 1990 to 44.2 per cent in 2004 while the Canadian market declined from 13.4 per cent of the total in 1990 to 9.1 per cent of the total in 2004.

Tourists to Dominica from the United States increased from 13.5 per cent of the total 45,087 arrivals in 1990 to 21.9 per cent of the total 80,077 arrivals in 2004. The major market for this island was the Caribbean market which accounted for an average 58.2 per cent of all tourists for the years 1990, 1995, 1998 to 2004 (See **Appendix 1.2 Table 1 (a)**).

Out of the total 82,008 visitors to Grenada in 1990, 30.2 per cent originated from other countries, 27.2 per cent from the United States, 21.4 per cent from other CARICOM countries (See **Appendix 1.2 Table 1 (a)**) and 15.4 per cent were from Europe. Major increases can be seen in the United Kingdom market which increased its share by 10 per cent from 1990 to 2004 and the CARICOM market which increased its share by 7 per cent.

For the period 1996 to 2005, tourists from the United States, the most important market in Guyana, increased market share from 39 per cent in 1996 to 51.5 per cent in 2005 although declines were registered from 1996 to 1997 and 1997 to 1998. The Canadian market was also significant in Guyana although its total share declined from 15.9 per cent of total arrivals in 1996 to 13.6 per cent in 2005.

The major markets in Jamaica were United States, Europe and Canada. While the United States market increased for the period, from 67.3 per cent to 70.4 per cent, the European market experienced small fluctuations increasing from 14.4 per cent in 1990 to 17.4 per cent in 1998 and then declining to 14.1 per cent in 2002 and finally increasing to 17.1 per cent to 2004 by the end of the period.

The major market for Montserrat during this period was CARICOM with an average of 43.8 per cent of the total or 4,113 tourists for the period 1998 to 2004 (See **Appendix 1.2 Table 1 (a)**). The United Kingdom was second with an average 24.8 per cent followed by the United States with 16.6 per cent.

Overall the total tourist arrivals to St. Kitts and Nevis declined from 98,848 in 1995 to 70,565 in 2001 before increasing by 35.6 per cent in 2002. The United States share of the St. Kitts and Nevis market saw two consecutive declines, from 1998 to 1999 by 2.7 per cent and by 9.2 per cent from 1999 to 2000. Since 1998, the share of tourist from Other countries doubled from 30.8 per cent to 61 per cent in 2004 while the Canadian and European Markets declined by 53 per cent and 46 per cent after initial percentage shares of 9.3 per cent and 10.3 per cent respectively.

The United States, Europe and the Caribbean were the main tourist markets for Saint Lucia. For the years 1990, 1995, 1998 to 2004 the total market share of United States, Europe and the Caribbean averaged 34.7 per cent, 31.0 per cent and 24.0 per cent respectively (**Appendix 1.2 Table 1 (a)**).

The data presented for St. Vincent and the Grenadines revealed that the Caribbean, The United States and Europe were the main tourist markets with averages 37.6 per cent, 28.8 per cent and 25.5 per cent of the total respectively.

More than 80 per cent of tourist to Suriname originated from Europe, specifically from Holland during the period 1995, 1998 to 2004 (See **Appendix 1.2 Table 1 (a)**).

Trinidad and Tobago's data shows that the United States was the major market with Other Countries also being important. Data also showed that tourists from Europe, Canada and the Caribbean also constituted a significant proportion of total arrivals averaging 11.6 per cent, 13 per cent and 10.3 per cent respectively. Tourist arrivals from the United States recorded increases during the period from 71,085 in 1990 to 159,467 in 2004 and its share of the total market averaged 34.3 per cent.

Data on the Associate Members, Anguilla, Bermuda and The Turks and Caicos Islands showed that tourist arrivals from the United States made up more than 60 per cent of all arrivals to the islands. The European and Caribbean markets were also significant markets in Anguilla while the more important market in Bermuda and The Turks and Caicos Islands was Canada.

Table 2.5 (a) Tourist Arrivals by country of Origin: 1990, 1995, 1998-2005

Country	Year	United States	Canada	Europe	Rest of the World	Total
BS	1990	1,321,930	96,755	96,625	46,355	1,561,665
	1995	1,328,925	85,600	114,950	68,660	1,598,135
	1998	1,250,026	83,086	117,954	76,641	1,527,707
	1999	1,293,235	87,973	125,485	70,373	1,577,066
	2000	1,294,295	82,840	104,610	62,214	1,543,959
	2001	1,308,163	79,715	94,047	55,855	1,537,780
	2002	1,310,140	68,592	79,564	54,855	1,513,151
	2003	1,305,335	63,148	93,170	48,516	1,510,169
	2004	1,360,912	68,462	83,590	48,348	1,561,312
BB	1990	143,295	57,841	147,804	83,152	432,092
	1995	111,983	53,373	195,970	80,781	442,107
	1998	106,314	59,946	250,352	96,002	512,614
	1999	104,953	57,333	243,993	108,335	514,614
	2000	112,153	59,957	260,775	111,811	544,696
	2001	106,629	52,381	246,125	101,943	507,078
	2002	123,429	46,754	217,934	109,782	497,899
	2003	129,326	49,641	232,090	120,154	531,211
	2004	129,664	50,032	243,977	127,829	551,502
DM	1990	6,066	1,524	9,329	28,168	45,087
	1995	10,923	1,828	12,940	34,780	60,471
	1998	14,121	1,904	11,710	37,766	65,501
	1999	15,613	2,158	12,001	43,734	73,506
	2000	15,078	2,177	11,145	41,198	69,598
	2001	14,493	1,870	10,825	39,205	66,393
	2002	15,464	2,039	10,131	41,559	69,193
	2003	15,638	1,968	10,772	44,812	73,190
	2004	17,570	1,724	10,208	50,575	80,077
GD	1990	22,321	4,333	12,668	42,686	82,008
	1995	30,033	3,920	24,822	49,232	108,007
	1998	31,640	5,343	27,357	51,454	115,794
	1999	34,694	6,136	30,553	53,906	125,289
	2000	32,541	4,849	36,822	54,652	128,864
	2001	32,219	5,442	32,153	53,537	123,351
	2002	36,508	4,684	32,741	58,483	132,416
	2003	35,154	5,599	36,856	64,746	142,355
	2004	30,127	5,309	30,933	67,496	133,865
GY	1996	35,833	14,585	6,063	35,491	91,972
	1997	33,295	11,499	5,212	25,731	75,737
	1998	27,513	9,419	4,297	17,376	58,605
	2000	46,177	15,948	7,229	35,688	105,042
	2001	46,999	12,916	8,689	30,713	99,317
	2002	50,058	14,190	8,190	31,903	104,341
	2003	49,625	14,144	8,136	29,006	100,911
	2004	56,629	14,217	8,036	28,745	107,627
	2005	60,071	15,876	8,704	31,945	116,596

Table 2.5 (a) Contd. Tourist Arrivals by country of Origin: 1990, 1995, 1998-2005

Country	Year	United States	Canada	Europe	Rest of the World	Total
JM	1990	565,504	113,917	121,049	40,307	840,777
	1995	760,304	108,440	197,544	80,713	1,147,001
	1998	829,330	109,802	212,689	73,466	1,225,287
	1999	870,019	100,338	208,689	69,351	1,248,397
	2000	942,561	107,492	198,979	73,658	1,322,690
	2001	916,681	111,158	180,632	68,045	1,276,516
	2002	925,629	97,413	179,089	64,235	1,266,366
	2003	969,699	95,265	218,500	66,821	1,350,285
	2004	996,151	105,623	241,925	71,087	1,414,786
MS	1998	891	216	1,539	5,061	7,707
	1999	1,356	307	2,296	5,926	9,885
	2000	1,561	346	2,652	5,778	10,337
	2001	1,652	368	2,540	5,262	9,822
	2002	1,950	375	2,759	4,752	9,836
	2003	1,541	297	2,414	4,138	8,390
	2004	2,084	334	3,197	4,523	10,138
KN	1995	37,166	9,187	10,141	42,354	98,848
	1998	39,907	7,596	15,166	27,897	90,566
	1999	34,716	5,880	15,759	27,647	84,002
	2000	23,474	5,395	12,841	31,439	73,149
	2001	25,558	5,237	8,726	31,044	70,565
	2002	27,525	4,352	5,464	58,336	95,677
LC	1990	43,220	14,600	35,980	47,187	140,987
	1995	84,377	11,243	73,046	62,593	231,259
	1998	81,161	15,439	81,103	74,534	252,237
	1999	83,475	13,153	95,352	71,813	263,793
	2000	97,532	14,968	91,717	65,633	269,850
	2001	91,248	12,254	76,405	70,225	250,132
	2002	94,044	12,927	70,611	75,881	253,463
	2003	98,078	13,494	85,025	80,351	276,948
	2004	107,089	15,315	92,341	83,686	298,431
VC	1990	13,401	4,399	14,277	21,836	53,913
	1995	15,762	4,702	17,551	22,191	60,206
	1998	20,709	4,501	20,301	21,717	67,228
	1999	19,156	4,509	20,264	24,364	68,293
	2000	...	...	...	...	72,895
	2001	19,311	3,929	18,850	28,546	70,636
	2002	22,412	5,268	17,997	31,954	77,631
	2003	22,194	4,918	17,198	34,225	78,535
	2004	25,106	5,219	18,653	37,743	86,721
	2005	27,153	6,187	19,928	42,237	95,505
	SR	1995	1,722	704	14,845	26,171	43,442
1998		456	86	45,280	8,763	54,585
1999		571	95	48,333	8,276	57,275
2000		712	189	45,137	10,805	56,843
2001		574	120	48,746	4,901	54,341
2002		767	91	53,592	5,783	60,233
2003		911	718	72,896	7,773	82,298
2004		1,059	731	62,552	10,545	74,887
2005		1,736	504	51,716	12,110	66,066

Table 2.5 (a) Contd. Tourist Arrivals by country of Origin: 1990, 1995, 1998-2005

Country	Year	United States	Canada	Europe	Rest of the World	Total
TT	1990	71,085	24,893	19,020	79,523	194,521
	1995	92,185	33,669	26,332	107,598	259,784
	1998	114,416	39,827	46,324	133,470	334,037
	1999	118,390	43,459	49,480	146,864	358,193
	2000	132,578	47,382	55,048	163,551	398,559
	2001	118,962	43,291	48,570	172,278	383,101
	2002	133,566	41,506	51,688	157,454	384,214
	2003	138,935	43,036	57,566	169,534	409,071
	2004	159,467	43,565	66,089	173,475	442,596
ASSOCIATE MEMBERS						
AI	1990	20,046	896	2,002	8,237	31,181
	1995	24,149	1,107	2,405	10,870	38,531
	1998	26,297	1,444	10,110	6,023	43,874
	1999	25,960	1,487	11,720	7,615	46,782
	2000	24,799	1,512	9,422	8,056	43,789
	2001	30,099	1,258	8,027	8,581	47,965
	2002	28,755	1,301	5,383	8,530	43,969
	2003	30,644	1,289	6,308	8,674	46,915
	2004	35,751	1,549	7,667	9,020	53,987
BM	1990	363,072	32,745	20,035	16,854	432,706
	1995	313,136	35,478	22,754	16,188	387,556
	1998	289,980	33,629	30,379	14,768	368,756
	1999	280,315	30,700	28,137	14,874	354,026
	2000	253,714	30,617	28,721	15,253	328,305
	2001	210,984	27,494	23,603	12,928	275,009
	2002	217,570	25,864	25,519	14,604	283,557
	2003	197,908	24,485	21,667	12,516	256,576
	2004	209,054	26,492	21,434	14,641	271,621
TC	1995	54,926	9,073	8,494	6,464	78,957
	1998	75,370	9,682	11,879	13,924	110,855
	1999	83,551	9,949	11,491	15,907	120,898
	2000	112,511	15,597	11,829	11,435	151,372
	2001	125,085	15,291	11,085	14,375	165,836
	2002	119,553	14,721	10,548	10,139	154,961
	2003	128,985	14,689	12,626	7,800	164,100
	2004	118,156	16,048	10,828	22,872	167,904
VG	1995	240,430	14,127	88,032	22,750	365,339
	1998e	255,756	13,951	97,271	24,033	391,011
	1999	319,285	21,090	108,040	35,641	484,056
	2000	344,627	21,765	125,700	27,317	519,409
	2001	355,763	13,757	132,479	33,112	535,111
	2002	348,035	18,092	148,150	29,146	543,423
	2003	422,154	22,302	169,928	43,119	657,503
	2004e	533,020	29,669	199,792	50,428	812,908

Table 2.5 (b) Percentage distribution of Tourist Arrivals by country of Origin: 1990, 1995, 1998-2005

Country	Year	United States	Canada	Europe	Rest of the World	Total
BS	1990	84.6	6.2	6.2	3.0	100.0
	1995	83.2	5.4	7.2	4.3	100.0
	1998	81.8	5.4	7.7	5.0	100.0
	1999	82.0	5.6	8.0	4.5	100.0
	2000	83.8	5.4	6.8	4.0	100.0
	2001	85.1	5.2	6.1	3.6	100.0
	2002	86.6	4.5	5.3	3.6	100.0
	2003	86.4	4.2	6.2	3.2	100.0
	2004	87.2	4.4	5.4	3.1	100.0
BB	1990	33.2	13.4	34.2	19.2	100.0
	1995	25.3	12.1	44.3	18.3	100.0
	1998	20.7	11.7	48.8	18.7	100.0
	1999	20.4	11.1	47.4	21.1	100.0
	2000	20.6	11.0	47.9	20.5	100.0
	2001	21.0	10.3	48.5	20.1	100.0
	2002	24.8	9.4	43.8	22.0	100.0
	2003	24.3	9.3	43.7	22.6	100.0
	2004	23.5	9.1	44.2	23.2	100.0
DM	1990	13.5	3.4	20.7	62.5	100.0
	1995	18.1	3.0	21.4	57.5	100.0
	1998	21.6	2.9	17.9	57.7	100.0
	1999	21.2	2.9	16.3	59.5	100.0
	2000	21.7	3.1	16.0	59.2	100.0
	2001	21.8	2.8	16.3	59.0	100.0
	2002	22.3	2.9	14.6	60.1	100.0
	2003	21.4	2.7	14.7	61.2	100.0
	2004	21.9	2.2	12.7	63.2	100.0
GD	1990	27.2	5.3	15.4	52.1	100.0
	1995	27.8	3.6	23.0	45.6	100.0
	1998	27.3	4.6	23.6	44.4	100.0
	1999	27.7	4.9	24.4	43.0	100.0
	2000	25.3	3.8	28.6	42.4	100.0
	2001	26.1	4.4	26.1	43.4	100.0
	2002	27.6	3.5	24.7	44.2	100.0
	2003	24.7	3.9	25.9	45.5	100.0
	2004	22.5	4.0	23.1	50.4	100.0
GY	1996	39.0	15.9	6.6	38.6	100.0
	1997	44.0	15.2	6.9	34.0	100.0
	1998	46.9	16.1	7.3	29.6	100.0
	2000	44.0	15.2	6.9	34.0	100.0
	2001	47.3	13.0	8.7	30.9	100.0
	2002	48.0	13.6	7.8	30.6	100.0
	2003	49.2	14.0	8.1	28.7	100.0
	2004	52.6	13.2	7.5	26.7	100.0
	2005	51.5	13.6	7.5	27.4	100.0

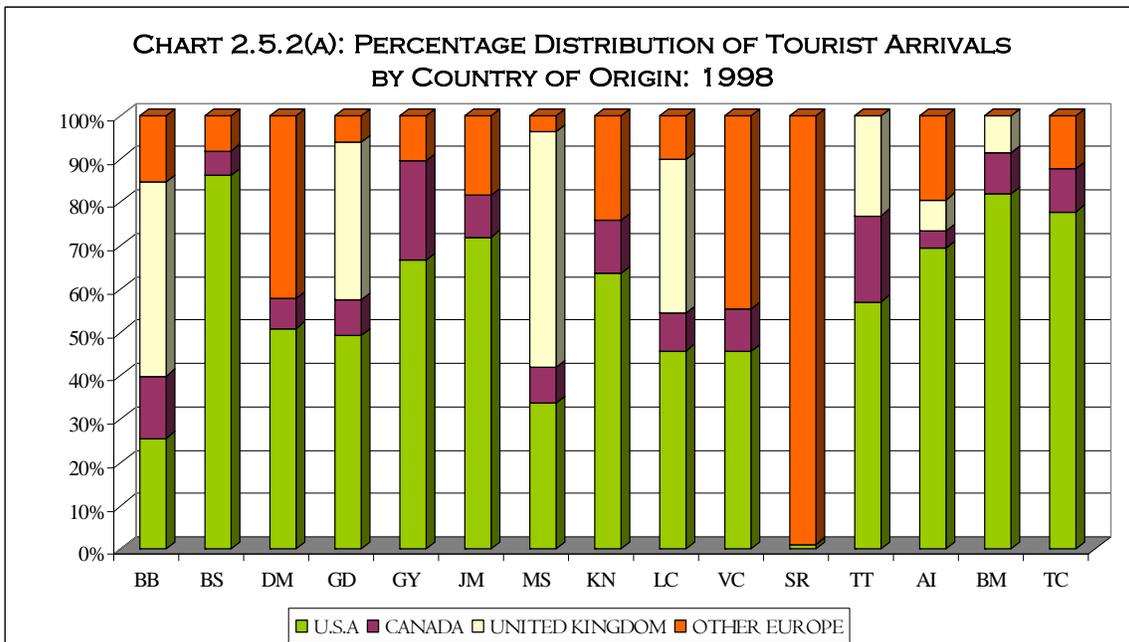
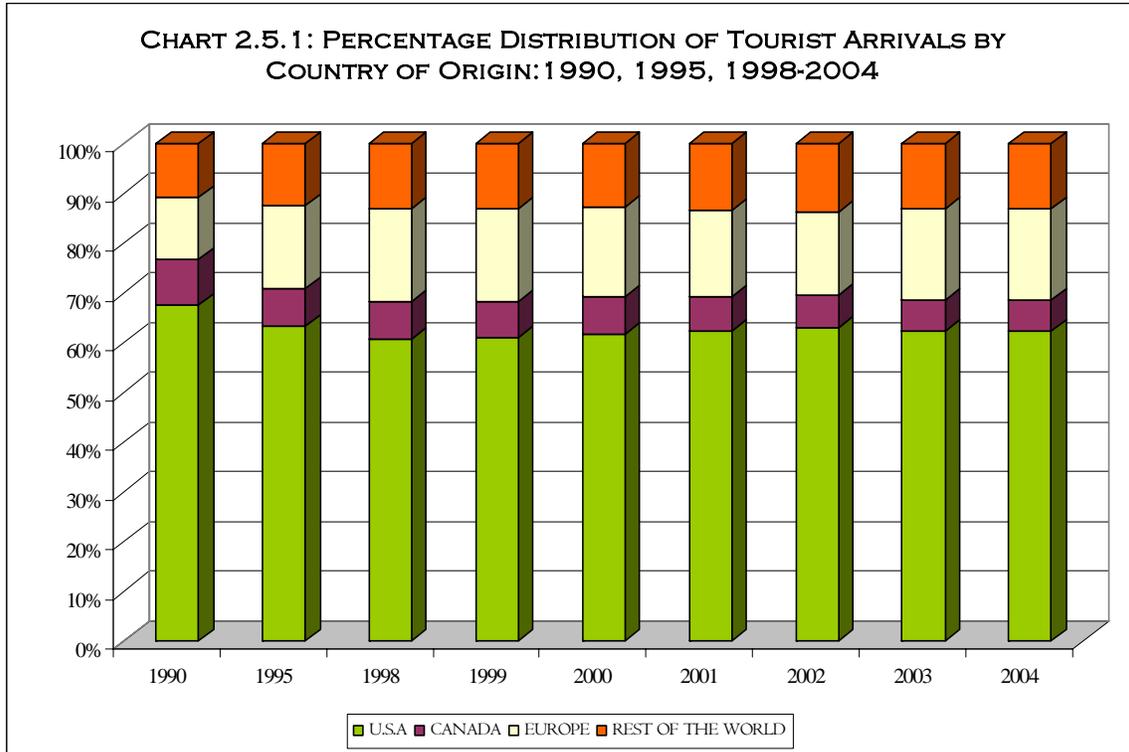
**Table 2.5 (b) Contd. Percentage distribution of Tourist Arrivals by country of Origin:
1990, 1995, 1998-2005**

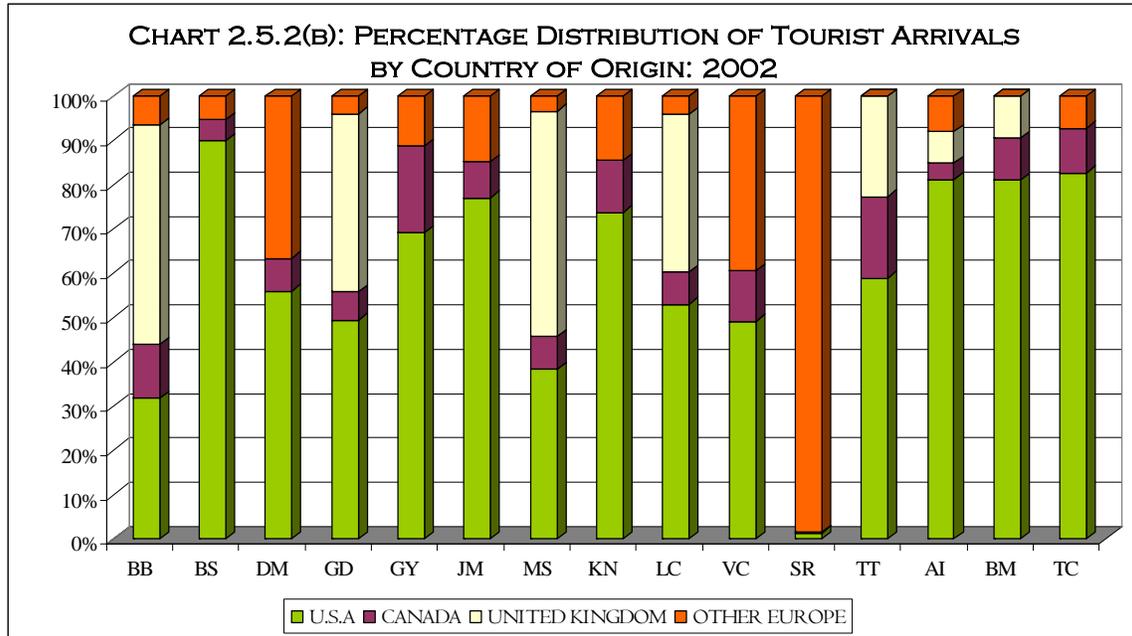
Country	Year	United States	Canada	Europe	Rest of the World	Total
JM	1990	67.3	13.5	14.4	4.8	100.0
	1995	66.3	9.5	17.2	7.0	100.0
	1998	67.7	9.0	17.4	6.0	100.0
	1999	69.7	8.0	16.7	5.6	100.0
	2000	71.3	8.1	15.0	5.6	100.0
	2001	71.8	8.7	14.2	5.3	100.0
	2002	73.1	7.7	14.1	5.1	100.0
	2003	71.8	7.1	16.2	4.9	100.0
2004	70.4	7.5	17.1	5.0	100.0	
MS	1998	11.6	2.8	20.0	65.7	100.0
	1999	13.7	3.1	23.2	59.9	100.0
	2000	15.1	3.3	25.7	55.9	100.0
	2001	16.8	3.7	25.9	53.6	100.0
	2002	19.8	3.8	28.1	48.3	100.0
	2003	18.4	3.5	28.8	49.3	100.0
	2004	20.6	3.3	31.5	44.6	100.0
KN	1995	42.4	10.5	11.1	36.1	100.0
	1998	44.1	8.4	16.7	30.8	100.0
	1999	41.3	7.0	18.8	32.9	100.0
	2000	32.1	7.4	17.6	43.0	100.0
	2001	36.2	7.4	12.4	44.0	100.0
	2002	28.8	4.5	5.7	61.0	100.0
LC	1990	30.7	10.4	25.5	33.5	100.0
	1995	36.5	4.9	31.6	27.1	100.0
	1998	32.2	6.1	32.2	29.5	100.0
	1999	31.6	5.0	36.1	27.2	100.0
	2000	36.1	5.5	34.0	24.3	100.0
	2001	36.5	4.9	30.5	28.1	100.0
	2002	37.1	5.1	27.9	29.9	100.0
	2003	35.4	4.9	30.7	29.0	100.0
	2004	35.9	5.1	30.9	28.0	100.0
VC	1990	24.9	8.2	26.5	40.5	100.0
	1995	26.2	7.8	29.2	36.9	100.0
	1998	30.8	6.7	30.2	32.3	100.0
	1999	28.0	6.6	29.7	35.7	100.0
	2000	...	...	...	...	100.0
	2001	27.3	5.6	26.7	40.4	100.0
	2002	28.9	6.8	23.2	41.2	100.0
	2003	28.3	6.3	21.9	43.6	100.0
	2004	29.0	6.0	21.5	43.5	100.0
	2005	28.4	6.5	20.9	44.2	100.0
	SR	1995	4.0	1.6	34.2	60.2	100.0
1998		0.8	0.2	83.0	16.1	100.0
1999		1.0	0.2	84.4	14.4	100.0
2000		1.3	0.3	79.4	19.0	100.0
2001		1.1	0.2	89.7	9.0	100.0
2002		1.3	0.2	89.0	9.6	100.0
2003		1.1	0.9	88.6	9.4	100.0
2004		1.4	1.0	83.5	14.1	100.0
2005	2.6	0.8	78.3	18.3	100.0	

**Table 2.5 (b) Contd. Percentage distribution of Tourist Arrivals by country of Origin:
1990, 1995, 1998-2005**

Country	Year	United States	Canada	Europe	Rest of the World	Total
TT	1990	36.5	12.8	9.8	40.9	100.0
	1995	35.5	13.0	10.1	41.4	100.0
	1998	34.3	11.9	13.9	40.0	100.0
	1999	33.1	12.1	13.8	41.0	100.0
	2000	33.3	11.9	13.8	41.0	100.0
	2001	31.1	11.3	12.7	45.0	100.0
	2002	34.8	10.8	13.5	41.0	100.0
	2003	34.0	10.5	14.1	41.4	100.0
	2004	36.0	9.8	14.9	39.2	100.0
	ASSOCIATE MEMBERS					
AI	1990	64.3	2.9	6.4	26.4	100.0
	1995	62.7	2.9	6.2	28.2	100.0
	1998	59.9	3.3	23.0	13.7	100.0
	1999	55.5	3.2	25.1	16.3	100.0
	2000	56.6	3.5	21.5	18.4	100.0
	2001	62.8	2.6	16.7	17.9	100.0
	2002	65.4	3.0	12.2	19.4	100.0
	2003	65.3	2.7	13.4	18.5	100.0
	2004	66.2	2.9	14.2	16.7	100.0
	BM*	1990	83.9	7.6	4.6	3.9	100.0
1995		80.8	9.2	5.9	4.2	100.0
1998		78.6	9.1	8.2	4.0	100.0
1999		79.2	8.7	7.9	4.2	100.0
2000		77.3	9.3	8.7	4.6	100.0
2001		76.7	10.0	8.6	4.7	100.0
2002		76.7	9.1	9.0	5.2	100.0
2003		77.1	9.5	8.4	4.9	100.0
2004		77.0	9.8	7.9	5.4	100.0
TC		1995	69.6	11.5	10.8	8.2	100.0
	1998	68.0	8.7	10.7	12.6	100.0
	1999	69.1	8.2	9.5	13.2	100.0
	2000	74.3	10.3	7.8	7.6	100.0
	2001	75.4	9.2	6.7	8.7	100.0
	2002	77.2	9.5	6.8	6.5	100.0
	2003	78.6	9.0	7.7	4.8	100.0
	2004	70.4	9.6	6.4	13.6	100.0
VG	1995	65.8	3.9	24.1	6.2	100.0
	1998e	65.4	3.6	24.9	6.1	100.0
	1999	66.0	4.4	22.3	7.4	100.0
	2000	66.3	4.2	24.2	5.3	100.0
	2001	66.5	2.6	24.8	6.2	100.0
	2002	64.0	3.3	27.3	5.4	100.0
	2003	64.2	3.4	25.8	6.6	100.0
	2004e	65.6	3.6	24.6	6.2	100.0

*Non-resident Air and Sea arrivals





Appendix 1.2

Table 1 (a) - Tourist Arrivals by Country of Origin: 1990, 1995, 1998-2005

Country	Year	U.S.A	Canada	United Kingdom	Other Europe	Other CARICOM	Caribbean	South America	Other Countries	Total All Countries
BS	1990	1,321,930	96,755		96,625				46,355	1,561,665
	1995	1,328,925	85,600		114,950				68,660	1,598,135
	1998	1,250,026	83,086		117,954				76,641	1,527,707
	1999	1,293,235	87,973		125,485				70,373	1,577,066
	2000	1,294,295	82,840		104,610				62,214	1,543,959
	2001	1,308,163	79,715		94,047				55,855	1,537,780
	2002	1,310,140	68,592		79,564				54,855	1,513,151
	2003	1,305,335	63,148		93,170				48,516	1,510,169
	2004	1,360,912	68,462		83,590				48,348	1,561,312
BB	1990	143,295	57,841	94,890	52,914	43,984	18,350	1,719	19,099	432,092
	1995	111,983	53,373	126,621	69,349	40,990	17,645	2,006	20,140	442,107
	1998	106,314	59,946	186,734	63,618	50,573	19,785	2,857	22,787	512,614
	1999	104,953	57,333	202,772	41,221	61,122	25,005	2,212	19,996	514,614
	2000	112,153	59,957	226,787	33,988	64,209	23,215	2,948	21,439	544,696
	2001	106,629	52,381	217,466	28,659	59,075	21,010	2,843	19,015	507,078
	2002	123,429	46,754	192,606	25,328	64,118	25,559	2,153	17,952	497,899
	2003	129,326	49,641	202,564	29,526	69,279	27,530	1,823	21,522	531,211
	2004	129,664	50,032	213,947	30,030	77,845	26,492	1,952	21,540	551,502
DM	1990	6,066	1,524		9,329		27,177		991	45,087
	1995	10,923	1,828		12,940		33,725		1,055	60,471
	1998	14,121	1,904		11,710		36,617		1,149	65,501
	1999	15,613	2,158		12,001		42,641		1,093	73,506
	2000	15,078	2,177		11,145		39,920		1,278	69,598
	2001	14,493	1,870		10,825		37,851		1,354	66,393
	2002	15,464	2,039		10,131		40,289		1,270	69,193
	2003	15,638	1,968		10,772		43,561		1,251	73,190
	2004	17,570	1,724		10,208		49,361		1,214	80,077
GD	1990	22,321	4,333	9,138	3,530	17,547			25,139	82,008
	1995	30,033	3,920	18,480	6,342	14,615			34,617	108,007
	1998	31,640	5,343	23,338	4,019	18,725			32,729	115,794
	1999	34,694	6,136	26,234	4,319	21,998			31,908	125,289
	2000	32,541	4,849	32,236	4,586	23,774			30,878	128,864
	2001	32,219	5,442	28,488	3,665	27,160			26,377	123,351
	2002	36,508	4,684	29,760	2,981	32,303			26,180	132,416
	2003	35,154	5,599	33,323	3,533	36,164			28,582	142,355
	2004	30,127	5,309	28,232	2,701	37,866			29,630	133,865
GY	1996	35,833	14,585	...	6,063	...	31,039	3,072	1,380	91,972
	1997	33,295	11,499	...	5,212	...	21,626	2,889	1,216	75,737
	1998	27,513	9,419	...	4,297	...	15,124	1,604	648	58,605
	2000	46,177	15,948	...	7,229	...	29,993	4,007	1,688	105,042
	2001	46,999	12,916	...	8,689	...	25,357	3,589	1,767	99,317
	2002	50,058	14,190	...	8,190	...	28,211	2,161	1,531	104,341
	2003	49,625	14,144	...	8,136	...	24,779	2,474	1,753	100,911
	2004	56,629	14,217	...	8,036	...	25,009	2,004	1,732	107,627
	2005	60,071	15,876	...	8,704	...	26,810	2,711	2,424	116,596

Table 1 (a) Contd. Tourist Arrivals by Country of Origin: 1990, 1995, 1998-2005

Country	Year	U.S.A	Canada	United Kingdom	Other Europe	Other CARICOM	Caribbean	South America	Other Countries	Total All Countries
JM	1990	565,504	113,917	...	121,049	...	20,870	...	19,437	840,777
	1995	760,304	108,440	...	197,544	...	29,386	...	51,327	1,147,001
	1998	829,330	109,802	...	212,689	...	36,818	...	36,648	1,225,287
	1999	870,019	100,338	...	208,689	...	38,023	...	31,328	1,248,397
	2000	942,561	107,492	...	198,979	...	43,971	...	29,687	1,322,690
	2001	916,681	111,158	...	180,632	...	40,845	...	27,200	1,276,516
	2002	925,629	97,413	...	179,089	...	41,138	...	23,097	1,266,366
	2003	969,699	95,265	...	218,500	...	43,829	...	22,992	1,350,285
	2004	996,151	105,623	...	241,925	...	49,443	...	21,644	1,414,786
	MS	1998	891	216	1,440	99	4,103	552	...	406	7,707
1999		1,356	307	2,178	118	4,615	612	...	699	9,885
2000		1,561	346	2,592	60	4,708	596	...	474	10,337
2001		1,652	368	2,419	121	4,379	766	...	117	9,822
2002		1,950	375	2,581	178	4,005	661	...	86	9,836
2003		1,541	297	2,269	145	3,342	731	...	65	8,390
2004		2,084	334	3,021	176	3,640	745	...	138	10,138
KN	1995	37,166	9,187	...	10,141	...	...	...	42,354	98,848
	1998	39,907	7,596	...	15,166	...	...	...	27,897	90,566
	1999	34,716	5,880	...	15,759	...	...	...	27,647	84,002
	2000	23,474	5,395	...	12,841	...	...	...	31,439	73,149
	2001	25,558	5,237	...	8,726	...	...	...	31,044	70,565
	2002	27,525	4,352	...	5,464	...	...	...	58,336	95,677
LC	1990	43,220	14,600	26,274	9,706	...	37,608	...	9,579	140,987
	1995	84,377	11,243	54,557	18,489	...	46,073	...	16,520	231,259
	1998	81,161	15,439	63,160	17,943	...	63,524	...	11,010	252,237
	1999	83,475	13,153	73,101	22,251	...	60,342	...	11,471	263,793
	2000	97,532	14,968	73,433	18,284	...	54,595	...	11,038	269,850
	2001	91,248	12,254	66,496	9,909	...	61,047	...	9,178	250,132
	2002	94,044	12,927	63,277	7,334	...	66,409	...	9,472	253,463
	2003	98,078	13,494	75,426	9,599	...	70,543	...	9,808	276,948
	2004	107,089	15,315	81,370	10,971	...	74,242	...	9,444	298,431
VC	1990	13,401	4,399	...	14,277	...	20,865	474	497	53,913
	1995	15,762	4,702	...	17,551	...	21,052	320	819	60,206
	1998	20,709	4,501	...	20,301	...	20,422	554	741	67,228
	1999	19,156	4,509	...	20,264	...	22,543	772	1,049	68,293
	2000	...	...	...	...	...	...	...	...	72,895
	2001	19,311	3,929	...	18,850	...	26,428	854	1,264	70,636
	2002	22,412	5,268	...	17,997	...	30,229	556	1,169	77,631
	2003	22,194	4,918	...	17,198	...	32,779	427	1,019	78,535
	2004	25,106	5,219	...	18,653	...	36,011	533	1,199	86,721
	2005	27,153	6,187	...	19,928	...	39,944	889	1,404	95,505

Table 1 (a) Contd. Tourist Arrivals by Country of Origin: 1990, 1995, 1998-2005

Country	Year	U.S.A	Canada	United Kingdom	Other Europe	Other CARICOM	Caribbean	South America	Other Countries	Total All Countries
SR	1995	1,722	704		14,845	10,279		6,815	9,077	43,442
	1998	456	86		45,280	3,858		757	4,148	54,585
	1999	571	95		48,333	3,905		1,270	3,101	57,275
	2000	712	189		45,137	4,597		2,129	4,079	56,843
	2001	574	120		48,746	1,707		719	2,475	54,341
	2002	767	91		53,592	2,116		1,065	2,602	60,233
	2003	911	718		72,896	2,593		2,315	2,865	82,298
	2004	1,059	731		62,552	2,247		3,058	5,240	74,887
TT	1990	71,085	24,893	19,020		17,309			62,214	194,521
	1995	92,185	33,669	26,332		27,470			80,128	259,784
	1998	114,416	39,827	46,324		34,922			98,548	334,037
	1999	118,390	43,459	49,480		42,734			104,130	358,193
	2000	132,578	47,382	55,048		46,618			116,933	398,559
	2001	118,962	43,291	48,570		43,008			129,270	383,101
	2002	133,566	41,506	51,688		50,528			106,926	384,214
	2003	138,935	43,036	57,566		56,540			112,994	409,071
2004	159,467	43,565	66,089		55,017			118,458	442,596	
ASSOCIATE MEMBERS										
AI	1990	20,046	896	2,002	-		7,675		562	31,181
	1995	24,149	1,107	2,405	-		10,016		854	38,531
	1998	26,297	1,444	2,738	7,372		4,793		1,230	43,874
	1999	25,960	1,487	2,703	9,017		6,002		1,613	46,782
	2000	24,799	1,512	2,786	6,636		6,084		1,972	43,789
	2001	30,099	1,258	2,789	5,238		6,682		1,899	47,965
	2002	28,755	1,301	2,529	2,854		6,925		1,605	43,969
	2003	30,644	1,289	2,962	3,346		6,830		1,844	46,915
2004	35,751	1,549	3,198	4,469		6,949		2,071	53,987	
BM*	1990	363,072	32,745	20,035					16,854	432,706
	1995	313,136	35,478	22,754					16,188	387,556
	1998	289,980	33,629	30,379					14,768	368,756
	1999	280,315	30,700	28,137					14,874	354,026
	2000	253,714	30,617	28,721					15,253	328,305
	2001	210,984	27,494	23,603					12,928	275,009
	2002	217,570	25,864	25,519					14,604	283,557
	2003	197,908	24,485	21,667					12,516	256,576
2004	209,054	26,492	21,434					14,641	271,621	
TC	1995	54,926	9,073		8,494		3,768	...	2,696	78,957
	1998	75,370	9,682		11,879		5,594	...	8,330	110,855
	1999	83,551	9,949		11,491		5,138	...	10,769	120,898
	2000	112,511	15,597		11,829		7,059	...	4,376	151,372
	2001	125,085	15,291		11,085		6,920	...	7,455	165,836
	2002	119,553	14,721		10,548		4,977	589	4,573	154,961
	2003	128,985	14,689		12,626		5,398	...	2,402	164,100
	2004	118,156	16,048		10,828		5,177	369	22,503	173,081

*Non-resident Air and Sea arrivals

Table 1 (b) Contd. Percentage Distribution of Tourist Arrivals by Country of Origin: 1990, 1995, 1998-2005

Country	Year	U.S.A	Canada	United Kingdom	Other Europe	Other CARICOM	Caribbean	South America	Other Countries	Total All Countries
BS	1990	84.6	6.2	0.0	6.2	0.0	0.0	0.0	3.0	100.0
	1995	83.2	5.4	0.0	7.2	0.0	0.0	0.0	4.3	100.0
	1998	81.8	5.4	0.0	7.7	0.0	0.0	0.0	5.0	100.0
	1999	82.0	5.6	0.0	8.0	0.0	0.0	0.0	4.5	100.0
	2000	83.8	5.4	0.0	6.8	0.0	0.0	0.0	4.0	100.0
	2001	85.1	5.2	0.0	6.1	0.0	0.0	0.0	3.6	100.0
	2002	86.6	4.5	0.0	5.3	0.0	0.0	0.0	3.6	100.0
	2003	86.4	4.2	0.0	6.2	0.0	0.0	0.0	3.2	100.0
	2004	87.2	4.4	0.0	5.4	0.0	0.0	0.0	3.1	100.0
BB	1990	33.2	13.4	22.0	12.2	10.2	4.2	0.4	4.4	100.0
	1995	25.3	12.1	28.6	15.7	9.3	4.0	0.5	4.6	100.0
	1998	20.7	11.7	36.4	12.4	9.9	3.9	0.6	4.4	100.0
	1999	20.4	11.1	39.4	8.0	11.9	4.9	0.4	3.9	100.0
	2000	20.6	11.0	41.6	6.2	11.8	4.3	0.5	3.9	100.0
	2001	21.0	10.3	42.9	5.7	11.7	4.1	0.6	3.7	100.0
	2002	24.8	9.4	38.7	5.1	12.9	5.1	0.4	3.6	100.0
	2003	24.3	9.3	38.1	5.6	13.0	5.2	0.3	4.1	100.0
	2004	23.5	9.1	38.8	5.4	14.1	4.8	0.4	3.9	100.0
DM	1990	13.5	3.4	0.0	20.7	0.0	60.3	0.0	2.2	100.0
	1995	18.1	3.0	0.0	21.4	0.0	55.8	0.0	1.7	100.0
	1998	21.6	2.9	0.0	17.9	0.0	55.9	0.0	1.8	100.0
	1999	21.2	2.9	0.0	16.3	0.0	58.0	0.0	1.5	100.0
	2000	21.7	3.1	0.0	16.0	0.0	57.4	0.0	1.8	100.0
	2001	21.8	2.8	0.0	16.3	0.0	57.0	0.0	2.0	100.0
	2002	22.3	2.9	0.0	14.6	0.0	58.2	0.0	1.8	100.0
	2003	21.4	2.7	0.0	14.7	0.0	59.5	0.0	1.7	100.0
	2004	21.9	2.2	0.0	12.7	0.0	61.6	0.0	1.5	100.0
GD	1990	27.2	5.3	11.1	4.3	21.4	0.0	0.0	30.7	100.0
	1995	27.8	3.6	17.1	5.9	13.5	0.0	0.0	32.1	100.0
	1998	27.3	4.6	20.2	3.5	16.2	0.0	0.0	28.3	100.0
	1999	27.7	4.9	20.9	3.4	17.6	0.0	0.0	25.5	100.0
	2000	25.3	3.8	25.0	3.6	18.4	0.0	0.0	24.0	100.0
	2001	26.1	4.4	23.1	3.0	22.0	0.0	0.0	21.4	100.0
	2002	27.6	3.5	22.5	2.3	24.4	0.0	0.0	19.8	100.0
	2003	24.7	3.9	23.4	2.5	25.4	0.0	0.0	20.1	100.0
	2004	22.5	4.0	21.1	2.0	28.3	0.0	0.0	22.1	100.0
GY	1996	39.0	15.9	0.0	6.6	0.0	33.7	3.3	1.5	100.0
	1997	44.0	15.2	0.0	6.9	0.0	28.6	3.8	1.6	100.0
	1998	46.9	16.1	0.0	7.3	0.0	25.8	2.7	1.1	100.0
	2000	44.0	15.2	0.0	6.9	0.0	28.6	3.8	1.6	100.0
	2001	47.3	13.0	0.0	8.7	0.0	25.5	3.6	1.8	100.0
	2002	48.0	13.6	0.0	7.8	0.0	27.0	2.1	1.5	100.0
	2003	49.2	14.0	0.0	8.1	0.0	24.6	2.5	1.7	100.0
	2004	52.6	13.2	0.0	7.5	0.0	23.2	1.9	1.6	100.0

Table 1 (b) Contd. Percentage Distribution of Tourist Arrivals by Country of Origin: 1990, 1995, 1998-2005

Country	Year	U.S.A	Canada	United Kingdom	Other Europe	Other CARICOM	Caribbean	South America	Other Countries	Total All Countries
JM	1990	67.3	13.5	0.0	14.4	0.0	2.5	0.0	2.3	100.0
	1995	66.3	9.5	0.0	17.2	0.0	2.6	0.0	4.5	100.0
	1998	67.7	9.0	0.0	17.4	0.0	3.0	0.0	3.0	100.0
	1999	69.7	8.0	0.0	16.7	0.0	3.0	0.0	2.5	100.0
	2000	71.3	8.1	0.0	15.0	0.0	3.3	0.0	2.2	100.0
	2001	71.8	8.7	0.0	14.2	0.0	3.2	0.0	2.1	100.0
	2002	73.1	7.7	0.0	14.1	0.0	3.2	0.0	1.8	100.0
	2003	71.8	7.1	0.0	16.2	0.0	3.2	0.0	1.7	100.0
	2004	70.4	7.5	0.0	17.1	0.0	3.5	0.0	1.5	100.0
MS	1998	11.6	2.8	18.7	1.3	53.2	7.2	0.0	5.3	100.0
	1999	13.7	3.1	22.0	1.2	46.7	6.2	0.0	7.1	100.0
	2000	15.1	3.3	25.1	0.6	45.5	5.8	0.0	4.6	100.0
	2001	16.8	3.7	24.6	1.2	44.6	7.8	0.0	1.2	100.0
	2002	19.8	3.8	26.2	1.8	40.7	6.7	0.0	0.9	100.0
	2003	18.4	3.5	27.0	1.7	39.8	8.7	0.0	0.8	100.0
	2004	20.6	3.3	29.8	1.7	35.9	7.3	0.0	1.4	100.0
KN	1995	37.6	9.3	0.0	10.3	0.0	0.0	0.0	42.8	100.0
	1998	44.1	8.4	0.0	16.7	0.0	0.0	0.0	30.8	100.0
	1999	41.3	7.0	0.0	18.8	0.0	0.0	0.0	32.9	100.0
	2000	32.1	7.4	0.0	17.6	0.0	0.0	0.0	43.0	100.0
	2001	36.2	7.4	0.0	12.4	0.0	0.0	0.0	44.0	100.0
	2002	28.8	4.5	0.0	5.7	0.0	0.0	0.0	61.0	100.0
LC	1990	30.7	10.4	18.6	6.9	0.0	26.7	0.0	6.8	100.0
	1995	36.5	4.9	23.6	8.0	0.0	19.9	0.0	7.1	100.0
	1998	32.2	6.1	25.0	7.1	0.0	25.2	0.0	4.4	100.0
	1999	31.6	5.0	27.7	8.4	0.0	22.9	0.0	4.3	100.0
	2000	36.1	5.5	27.2	6.8	0.0	20.2	0.0	4.1	100.0
	2001	36.5	4.9	26.6	4.0	0.0	24.4	0.0	3.7	100.0
	2002	37.1	5.1	25.0	2.9	0.0	26.2	0.0	3.7	100.0
	2003	35.4	4.9	27.2	3.5	0.0	25.5	0.0	3.5	100.0
	2004	35.9	5.1	27.3	3.7	0.0	24.9	0.0	3.2	100.0
	VC	1990	24.9	8.2	0.0	26.5	0.0	38.7	0.9	0.9	100.0
1995		26.2	7.8	0.0	29.2	0.0	35.0	0.5	1.4	100.0
1998		30.8	6.7	0.0	30.2	0.0	30.4	0.8	1.1	100.0
1999		28.0	6.6	0.0	29.7	0.0	33.0	1.1	1.5	100.0
2001		27.3	5.6	0.0	26.7	0.0	37.4	1.2	1.8	100.0
2002		28.9	6.8	0.0	23.2	0.0	38.9	0.7	1.5	100.0
2003		28.3	6.3	0.0	21.9	0.0	41.7	0.5	1.3	100.0
2004		29.0	6.0	0.0	21.5	0.0	41.5	0.6	1.4	100.0
2005		28.4	6.5	0.0	20.9	0.0	41.8	0.9	1.5	100.0

Table 1 (b) Contd. Percentage Distribution of Tourist Arrivals by Country of Origin: 1990, 1995, 1998-2005

Country	Year	U.S.A	Canada	United Kingdom	Other Europe	Other CARICOM	Caribbean	South America	Other Countries	Total All Countries
SR	1995	4.0	1.6	0.0	34.2	23.7	0.0	15.7	20.9	100.0
	1998	0.8	0.2	0.0	83.0	7.1	0.0	1.4	7.6	100.0
	1999	1.0	0.2	0.0	84.4	6.8	0.0	2.2	5.4	100.0
	2000	1.3	0.3	0.0	79.4	8.1	0.0	3.7	7.2	100.0
	2001	1.1	0.2	0.0	89.7	3.1	0.0	1.3	4.6	100.0
	2002	1.3	0.2	0.0	89.0	3.5	0.0	1.8	4.3	100.0
	2003	1.1	0.9	0.0	88.6	3.2	0.0	2.8	3.5	100.0
	2004	1.4	1.0	0.0	83.5	3.0	0.0	4.1	7.0	100.0
TT	1990	36.5	12.8	9.8	0.0	8.9	0.0	0.0	32.0	100.0
	1995	35.5	13.0	10.1	0.0	10.6	0.0	0.0	30.8	100.0
	1998	34.3	11.9	13.9	0.0	10.5	0.0	0.0	29.5	100.0
	1999	33.1	12.1	13.8	0.0	11.9	0.0	0.0	29.1	100.0
	2000	33.3	11.9	13.8	0.0	11.7	0.0	0.0	29.3	100.0
	2001	31.1	11.3	12.7	0.0	11.2	0.0	0.0	33.7	100.0
	2002	34.8	10.8	13.5	0.0	13.2	0.0	0.0	27.8	100.0
	2003	34.0	10.5	14.1	0.0	13.8	0.0	0.0	27.6	100.0
2004	36.0	9.8	14.9	0.0	12.4	0.0	0.0	26.8	100.0	
ASSOCIATE MEMBERS										
AI	1990	64.3	2.9	6.4	0.0	0.0	24.6	0.0	1.8	100.0
	1995	62.7	2.9	6.2	0.0	0.0	26.0	0.0	2.2	100.0
	1998	59.9	3.3	6.2	16.8	0.0	10.9	0.0	2.8	100.0
	1999	55.5	3.2	5.8	19.3	0.0	12.8	0.0	3.4	100.0
	2000	56.6	3.5	6.4	15.2	0.0	13.9	0.0	4.5	100.0
	2001	62.8	2.6	5.8	10.9	0.0	13.9	0.0	4.0	100.0
	2002	65.4	3.0	5.8	6.5	0.0	15.7	0.0	3.7	100.0
	2003	65.3	2.7	6.3	7.1	0.0	14.6	0.0	3.9	100.0
2004	66.2	2.9	5.9	8.3	0.0	12.9	0.0	3.8	100.0	
BM*	1990	83.9	7.6	4.6	0.0	0.0	0.0	0.0	3.9	100.0
	1995	80.8	9.2	5.9	0.0	0.0	0.0	0.0	4.2	100.0
	1998	78.6	9.1	8.2	0.0	0.0	0.0	0.0	4.0	100.0
	1999	79.2	8.7	7.9	0.0	0.0	0.0	0.0	4.2	100.0
	2000	77.3	9.3	8.7	0.0	0.0	0.0	0.0	4.6	100.0
	2001	76.7	10.0	8.6	0.0	0.0	0.0	0.0	4.7	100.0
	2002	76.7	9.1	9.0	0.0	0.0	0.0	0.0	5.2	100.0
	2003	77.1	9.5	8.4	0.0	0.0	0.0	0.0	4.9	100.0
2004	77.0	9.8	7.9	0.0	0.0	0.0	0.0	5.4	100.0	
TC	1995	69.6	11.5	0.0	10.8	0.0	4.8	0.0	3.4	100.0
	1998	68.0	8.7	0.0	10.7	0.0	5.0	0.0	7.5	100.0
	1999	69.1	8.2	0.0	9.5	0.0	4.2	0.0	8.9	100.0
	2000	74.3	10.3	0.0	7.8	0.0	4.7	0.0	2.9	100.0
	2001	75.4	9.2	0.0	6.7	0.0	4.2	0.0	4.5	100.0
	2002	77.2	9.5	0.0	6.8	0.0	3.2	0.4	3.0	100.0
	2003	78.6	9.0	0.0	7.7	0.0	3.3	0.0	1.5	100.0
	2004	68.3	9.3	0.0	6.3	0.0	3.0	0.2	13.0	100.0

*Non-resident Air and Sea arrivals

Appendix 2.2

2.2.1 (i) (a): Sources of Data for Table 2.1 (a): Tourists, Cruise Ship Arrivals and Number of Tourist Nights Spent by Year

Country	Data Source
THE BAHAMAS	Immigration Card and Research and Statistics Department, Ministry of Tourism
BARBADOS	National Statistics Office
BELIZE	Belize Tourism Board/ ESU,MNRE
DOMINICA	Central Statistical Office
GRENADA	Central Statistical Office/ Economic Section
JAMAICA	Jamaica Tourist Board
ST. KITTS AND NEVIS	1995, 1996. C.T.O. Statistical Report 1994, 1995, 1999-2000; 2002-2003, ECCB Statistical Digest 1998. (1997) ; 1999 (1998), 2000-2001 : ECCB Economic and Financial Review Dec 2001& Dec.2002
SAINT LUCIA	Government Statistics Department
ST. VINCENT AND THE GRENADINES	National Statistics Office
SURINAME	General Bureau of Statistics, Section: Traffic and Transport Statistics
TRINIDAD AND TOBAGO	Central Statistical Office/Tourism
ANGUILLA	Statistics Department
BERMUDA	Department of Statistics: Facts and Figures
THE BRITISH VIRGIN ISLANDS	Development Planning Unit
THE TURKS AND CAICOS ISLANDS	Tourist Board

2.2.1 (i)(b): Notes for Table 2.1 (a): Tourists, Cruise Ship Arrivals and Number of Tourist Nights Spent by Year

Country	Notes
BELIZE	b/-average number of tourist nights available
ST. VINCENT AND THE GRENADINES	Data provided by the Ministry of Tourism is tabulated according to the following categories: Stopovers (tourists), Excursionists (same day), Cruise ships and Yachts.
THE BRITISH VIRGIN ISLANDS	e means estimate
THE TURKS AND CAICOS ISLANDS	Number of tourist nights spent is based on the Survey of Departing Visitors 2002 & 2004: Statistical Office.

2.2.1(ii) (a): Sources of Data for Table 2.1 (b): Tourist Intensity/Growth Rate and Tourist Penetration Ratio

Country	Data Source
BELIZE	Belize Tourism Board/ ESU,MNRE
DOMINICA	Central Statistical Office
THE TURKS AND CAICOS ISLANDS	Tourist Board

2.2.1(ii) (b): Notes for Table 2.1 (b): Tourist Intensity/Growth Rate and Tourist Penetration Ratio

Country	Notes
THE TURKS AND CAICOS ISLANDS	TCI has 366.11 square miles or 948.23 square km

2.2.2 (a): Sources of Data for Table 2.2: Number of Hotels Classified by Size, Beds and Rooms by Year

Country	Data Source
THE BAHAMAS	Hotel Licensing
BARBADOS	National Statistics Office
BELIZE	Belize Tourism Board
GRENADA	Central Statistical Office/ Economic Section
JAMAICA	Jamaica Tourist Board
SAINT LUCIA	Saint Lucia Tourist Board
TRINIDAD AND TOBAGO	Central Statistical Office/Tourism
BERMUDA	Department of Statistics: Facts and Figures
THE BRITISH VIRGIN ISLANDS	Development Planning Unit
THE TURKS AND CAICOS ISLANDS	Tourist Board. Room Occupancy Source: Turks and Caicos Hotel and Tourism Association

2.2.2(b): Notes for Table 2.2: Number of Hotels Classified by Size, Beds and Rooms by Year

Country	Notes
THE BAHAMAS	Total number of beds available was calculated based on double occupancy. Total number of rooms occupied is based on a sample of large and some small hotels in the Bahamas.
JAMAICA	Room 25 and more and less than 50 refer to rooms 50 and under. Rooms 50 and more refer to rooms 51 and more. Number of apartments, resort villas and guesthouses included in 50 rooms and under category.
SAINT LUCIA	Data provided is for all accommodation establishments (i.e. hotels, villas/apartments, guest houses).
THE BRITISH VIRGIN ISLANDS	e means estimate.
THE TURKS AND CAICOS ISLANDS	Room occupancy rate was sourced from the Turks and Caicos Hotel and Tourism Association (TCHTA) and the rate reflects only for the members of this association which is in fact many of the largest accommodations. Therefore, the formula for the rate was not applied to obtain these figures but they were taken directly from the TCHTA.

2.2.3 (a): Sources of Data for Table 2.3: Visitor expenditure and Number Employed in Tourism

Country	Data Source
THE BAHAMAS	Research and Statistics Department, Ministry of Tourism
BARBADOS	National Statistics Office
BELIZE	Belize Tourism Board
GRENADA	National Statistics Office
JAMAICA	Jamaica Tourist Board
MONTSERRAT	Statistics Department, Development Unit
ST. KITTS AND NEVIS	1995, 1996. C.T.O. Statistical Report 1994, 1995, 1999-2000; 2002-2003, ECCB Statistical Digest 1998. (1997) ; 1999 (1998), 2000-2001 : ECCB Economic and Financial Review Dec 2001& 2002
SAINT LUCIA	Government Statistics Department
ST. VINCENT AND THE GRENADINES	The Statistical Office
TRINIDAD AND TOBAGO	Central Statistical Office/Tourism
ANGUILLA	Statistics Department
BERMUDA	Department of Statistics
THE BRITISH VIRGIN ISLANDS	Development Planning Unit
THE TURKS AND CAICOS ISLANDS	Statistical Office, Survey of Departing Visitors, June 2002

2.2.3 (b): Notes for Table 2.3: Visitor expenditure and Number Employed in Tourism

Country	Notes
THE BAHAMAS	Visitor Expenditure is total expenditure including day and cruise visitors. Information listed under International and Domestic expenditure consists of stopover and cruise expenditures for visitors only. Expenditure on accommodation, meals and drinks, shopping, entertainment, etc is based on stopover visitors only.
JAMAICA	Expenditure on same-day visits = average expenditure per person - cruise passengers. Expenditure on accommodation, meals and drinks, shopping, entertainment, etc = average expenditure per person per night. Data for total directly employed in tourism refers to the accommodation sector.
THE BRITISH VIRGIN ISLANDS	Expenditure on accommodation, ..., entertainment, etc. includes expenditure on hotel, charter boat, rented accommodation, own accommodation, friend, etc. e means estimate.
THE TURKS AND CAICOS ISLANDS	Employment in Tourism (2001) is taken as those employed in 'hotels, restaurant, tourism' industrial classification for the 2001 Census.

2.2.4 (a): Sources of Data for Table 2.4: Tourist Arrivals by Type of Accommodation

Country	Data Source
THE BAHAMAS	Immigration Card and Research and Statistics Department, Ministry of Tourism
GRENADA	Central Statistical Office/Economic Section
MONTserrat	Statistics Department, Development Unit
SAINT LUCIA	Saint Lucia Tourist Board
ST. VINCENT AND THE GRENADINES	Ministry of Tourism
SURINAME	The figures are from the Ministry of Justice, Department of Foreign Affairs and include all visitors who stay longer than 7 days (8 days and more and less than 365 days) in Suriname. These visitors have to register themselves at this Department.
TRINIDAD AND TOBAGO	Central Statistical Office/Tourism
BERMUDA	Department of Statistics: Quarterly Report from the Department of Tourism
THE BRITISH VIRGIN ISLANDS	Development Planning Unit
THE TURKS AND CAICOS ISLANDS	Tourist Board

2.2.4 (b): Notes for Table 2.4: Tourist Arrivals by Type of Accommodation

Country	Notes
THE BAHAMAS	Other includes no response and timeshare.
MONTSERRAT	Cottages/yacht/private homes include only private homes. Other includes Bed and Breakfasts.
SAINT LUCIA	Estimates were used to calculate data for 2001. Cottages/ Yacht/ Private Home refer to private dwellings, boats and condos. Other includes Undefined Inns, Other Paid Accommodation, and Not Stated.
ST. VINCENT AND THE GRENADINES	Other includes Not Stated. Villas includes resorts. Apartments include villas for data from 2002-2005. The data for years 1998-2000, the category "Hotel" includes villas. Cottages/ Yacht/ Private Home refer to private accommodation.
SURINAME	Guest houses include pension. Other includes unknown. 2004* and 2005* - Number of tourist arrivals as presented by the Suriname Tourist Foundation and includes all stay over visitors. This is due to a new method that is used for registering tourist arrivals- starting point: 2004.
BERMUDA	Other includes private homes and not stated.
THE BRITISH VIRGIN ISLANDS	Cottages/ Yacht / Private Home include charter boat and own or friend's private home. Other includes rented accommodations. e means estimate.
THE TURKS AND CAICOS ISLANDS	Other includes live aboard, B&B and private dwellings. Breakdown for 2004 is not yet available.

2.2.5 (a): Sources of Data for Table 2.5: Tourist Arrivals by Country of Origin

Country	Data Source
THE BAHAMAS	Immigration Card and Research & Statistics Department, Ministry of Tourism
BARBADOS	National Statistics Office
DOMINICA	Central Statistical Office
GRENADA	Central Statistical Office/ Economic Section
GUYANA	Bureau of Statistics and Guyana Tourism Authority
JAMAICA	Jamaica Tourist Board
MONTSERRAT	Statistical Department, Development Unit
ST. KITTS AND NEVIS	1995, 1996. C.T.O. Statistical Report 1994, 1995, 1999-2000; 2002-2003, ECCB Statistical Digest 1998. (1997); 1999 (1998), 2000-2001 :ECCB Economic and Financial Review Dec 2001& Dec.2002
SAINT LUCIA	Government Statistics Department
ST. VINCENT AND THE GRENADINES	Ministry of Tourism
SURINAME	National Statistics Office
TRINIDAD AND TOBAGO	Central Statistical Office/Tourism
ANGUILLA	Statistics Department
BERMUDA	Department of Statistics - Quarterly Report from the Department of Tourism
THE TURKS AND CAICOS ISLANDS	Tourist Board

2.2.5 (b): Notes for Table 2.5: Tourist Arrivals by Country of Origin

Country	Notes
THE BAHAMAS	Other Europe = Europe
BARBADOS	Caribbean = Trinidad and Tobago. South America = Venezuela. Other = Other + Other LAFTA countries.
DOMINICA	Other Europe = Europe.
GRENADA	Other Europe = Germany. Other CARICOM = CARICOM.
GUYANA	1998 figures are from January - November only. Other Europe refers to Europe. South America refers to South and Central America. Other includes not stated.
JAMAICA	Other Europe = Europe. Other = Other + Latin America. Other countries are: U.K., Denmark, Finland, Norway, Sweden, Greece, Italy, Portugal, Spain, Austria, Belgium, France, Germany, Luxemburg, Netherlands, Switzerland, Czechoslovakia, Hungary, Poland, Russia as well as other European countries, Japan, Israel, Saudi Arabia, Turkey, India, Pakistan, China, Taiwan, Korea, The Philippines, Singapore, Australia and New Zealand, other Asian countries, Brazil, Mexico, Belize, Costa Rica, El Salvador, Guatemala, Nicaragua, Panama, Argentina, Bolivia, Chile, Colombia, Ecuador, Paraguay, Peru, Surinam, Uruguay and Venezuela.
MONTSERRAT	Other CARICOM includes OECS countries and Rest of CARICOM. Caribbean includes all other Caribbean countries that are not members of CARICOM. Other countries include Latin America.
SAINT LUCIA	Other Europe includes Germany and France.
ST. VINCENT AND THE GRENADINES	Data is tabulated by the Ministry of Tourism as Tourist arrival by country of residence rather than by country of origin. Other Europe refers to Europe.
SURINAME	Data is tabulated as tourist Arrival by nationality. Dutch nationals are included in Other Europe. Other CARICOM refers to Dominicans, Trinidadians, Haitians and Guyanese. South America refers to Brazil. Other includes Chinese Nationals and Other.
TRINIDAD AND TOBAGO	Other CARICOM refers to Barbados and Grenada.
ANGUILLA	Other Europe includes Germany and Italy.

**EH1: NUMBER OF REPORTED CASES AND INCIDENCE
OF ENVIRONMENTALLY RELATED DISEASES****DK****Concept and Definition**

Environmentally related diseases refer to diseases that cause an interruption, cessation or disorder of human bodily functions, systems or organs due to unfavorable environmental factors. According to the Dictionary of Epidemiology, edited for the International Epidemiological Association by John M. Last, a case in epidemiology is a person in the population or study group identified as having the particular disease, health disorder, or condition under investigation. A variety of criteria may be used to identify cases, e.g. individual physician's diagnoses, registries and notifications, abstracts of clinical records, surveys of the general population, and population screening, among others. The epidemiological definition of a case is not necessarily the same as the ordinary clinical definition. (<http://www.paho.org/English/SHA/be991norms.htm>)

A **CASE** refers to a person who has the particular disease, health disorder, or condition which meets the case definition for surveillance and outbreak investigation purposes. The definition of a case for surveillance and outbreak investigation purpose is not necessarily the same as the ordinary clinical definition.

PREVALENCE refers to the number of instances of illness or of persons ill, or of any other event such as accidents, in a specified population, without any distinction between new and old cases. Prevalence may be recorded at a stated moment (point prevalence) or during a given period of time (period prevalence). (*Prevalence and Incidence. WHO Bulletin, 1966; 35:783-784*).

An **INCIDENCE** is the number of instances of illness commencing, or of persons falling ill, during a given period in a specified population. Incidence is usually expressed as a rate, the denominator being the average number of persons in the specified population during the defined period or the estimated number of persons at the mid-point of that period (*Prevalence and Incidence. WHO Bulletin, 1966, 35: 783-784*).

REPORTED CASES refers to the number of cases reported/registered in a specific year, for a given country, territory, or geographic area.

Types of Environmentally Related Diseases

Gastroenteritis is an inflammation of the stomach and intestines with many possible causes, such as: bacteria (responsible for acute food poisoning), parasites, food intolerances, drugs (antibiotics in particular) or most common viral infections. Symptoms can include nausea, vomiting, diarrhea, fever, abdominal cramping and/or pain and a general feeling of tiredness. It is often called the "stomach flu", although it is not caused by the influenza viruses. (*Please refer to the Center for Disease Control website at*

<http://www.cdc.gov/ncidod/dvrd/revb/gastro/faq.htm>.)

Typhoid: Typhoid fever is a bacterial infection caused by ingesting contaminated food or water. Symptoms are characterized by headaches, nausea and loss of appetite.

Malaria is caused by a parasite called *Plasmodium*, which is transmitted via the bites of infected mosquitoes. In the human body, the parasites multiply in the liver, and then infect red blood cells. Symptoms of malaria include fever, headache, and vomiting, and usually appear between 10 and 15 days after the mosquito bite. If not treated, malaria can quickly become life-threatening by disrupting the blood supply to vital organs.

(Please refer to the World Health Organization's website at <http://www.who.int/topics/malaria/en/>)

Cholera is an acute intestinal infection caused by ingestion of food or water contaminated with the bacterium *Vibrio cholerae*. It has a short incubation period, from less than one day to five days, and produces an enterotoxin that causes a copious, painless, watery diarrhoea that can quickly lead to severe dehydration and death if treatment is not promptly given. Vomiting also occurs in most patients.

(Please refer to the World Health Organization's website at <http://www.who.int/topics/cholera/en/>)

Poisoning: A poison is any substance that causes harm if it gets into the body. Harm can be mild (for example, headache or nausea) or severe (for example, fits or very high fever), and severely poisoned people may die. When people are in contact with a poison they are said to be exposed to it. Exposure may happen only once or many times. *Acute exposure* is a single contact that lasts for seconds, minutes or hours, or several exposures over about a day or less. *Chronic exposure* is contact that lasts for many days, months or years. It may be continuous or broken by periods when there is no contact. Chronic exposure to small amounts of poison may not cause any signs or symptoms of poisoning at first. It may be many days or months before there is enough chemical inside the body to cause poisoning.

Dengue is an acute, febrile illness, caused by one of four types of dengue virus. Viral transmission is through the bite of an infected *Aedes Aegypti* mosquito. The disease occurs in all countries infested with the vector and is prevalent in the Caribbean. Dengue fever is usually seasonal, with an increase in cases occurring after the onset of the rainy season.

Accidental Pesticide Poisoning: A case of *Accidental Pesticide Poisoning* is defined as any person who, after having been exposed to one or more pesticides, presents clinical manifestations of poisoning, or specific laboratory test results compatible with poisoning, in the first 24 hours after contact. Accidental refers to the unintentional and unexpected exposure to pesticides. This includes food poisoning. (*PAHO/WHO Epidemiological Bulletin, Vol. 22 No. 4, December 2000*)

Diarrhoea is the passage of three (3) or more loose or liquid stools per day, or more frequently than is normal for the individual. It is usually a symptom of gastrointestinal infection, which can be caused by a variety of bacterial, viral and parasitic organisms. Infection is spread through contaminated food or drinking-water, or from person to person as a result of poor hygiene. Severe diarrhea leads to fluid loss, and may be life-threatening, particularly in young children and people who are malnourished or have impaired immunity.

(Please refer to the World Health Organization's website at <http://www.who.int/topics/diarrhoea/en/>)

Respiratory tract diseases are diseases that affect the air passages, including the nasal passages, the bronchi and the lungs. They range from acute infections, such as pneumonia and bronchitis, to chronic conditions such as asthma and chronic obstructive pulmonary disease. *(Please refer to the World Health Organization's website at http://www.who.int/topics/respiratory_tract_diseases/en/ [last accessed: June 15th 2009])*

Other: Other refers to any other environmentally related diseases not previously mentioned.

Method of Computation

The number of reported cases and incidence of environmentally related diseases is classified from data obtained from Member States/Associate Members according to the categories: Gastroenteritis, Typhoid, Malaria, Cholera, Accidental Pesticide Poisoning, Dengue, Poisoning, Diarrhoea, Respiratory Diseases and Other as defined above.

Indicator Relevance

Setting priorities for action to reduce hazardous environmental exposures and their health effects, and evaluating the effectiveness of the actions carried out, require reliable information. This indicator, the number of reported cases and incidence of environmentally related diseases, provides the means for that information to be collected to ensure good decision making and the monitoring of potentially deadly exposure to environmental diseases.

Data Assessment

Of the eighteen Member States and Associate Members in the Community who usually submit data, only nine provided data for this indicator. Those nine countries were The Bahamas, Belize, Dominica, Grenada, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, Bermuda and The Turks and Caicos Islands. Of those nine countries, only The Bahamas, Belize, Dominica and Bermuda provided detailed data.

The degree of harmonisation for this indicator is difficult to assess since definitions were not provided by reporting Member States and Associate Members.

Data Sources

Please refer to **Appendix 1.3.1 (a)** for the sources of the data on the number of reported cases and incidence of environmentally related diseases of Member States and Associate Members.

Evaluation

Table 3.1 below reveals that *gastroenteritis*, *malaria*, *dengue* and *respiratory diseases* were the most significant environmentally related diseases in the Region during the period. *Gastroenteritis* was found to be prevalent in most Member States but more pronounced in Trinidad and Tobago. *Malaria*, meanwhile, was most prevalent in Suriname whereas in Trinidad and Tobago *dengue* was more common. Belize also reported a significant number of total cases of environmentally related diseases during the period with *Malaria* being the most common. Eight countries also presented data by gender with no significant disparities between men and women. Most notable was the increased cases of *Respiratory diseases*, a significant indicator of pollution, for most Member States from a total of 1,551 cases in 1998¹ to 10,179 cases in 2004². For both Associate Members, *Respiratory disease* was the highest reported environmentally related disease.

During the period 1998 to 2003, *Gastroenteritis* was the most significant environmental related disease in The Bahamas followed by *Other environmental related disease* which includes *Foodborne Illnesses*, *Leptospirosis*, *Salmonellosis*, *Shigellosis*, *Amoebiasis* of which *Foodborne Illnesses* accounted for more than 90 per cent of this value. Cases of *Gastroenteritis* in The Bahamas ranged from 1,493 in 1999 to 4,904 in 2002.

Data for Belize showed that *Gastroenteritis*, *Malaria*, *Diarrhoea* and *Respiratory diseases* were the most significant among reported environmental related diseases for the period 1998 to 2004. Reported cases of environmental related diseases were highest in 1998 (8,797) and 1999 (9,044) where *Diarrhoea* and *Gastroenteritis* accounted for 58 and 68 per cent of total cases, respectively. *Malaria* was the most significant environmental related disease in Belize during the period 1999 to 2003.

Reported cases of environmental related diseases revealed that *Gastroenteritis* was most significant for Dominica during 1998 to 2004. In Grenada, an alarming number of cases of *Respiratory diseases* were reported during 1999 to 2004 ranging from a high of 9,503 cases in 2002 to 6,954 cases in 2001 and representing more than 70 per cent all cases reported. St. Vincent and the Grenadines reported data on *Gastroenteritis* cases only for the period 2000 to 2004 with the highest number of cases 3,787 reported in 2003.

¹ Includes totals for The Bahamas, Belize and Bermuda.

² Excludes The Bahamas for which data is not available.

Suriname reported significant cases of *Malaria* and *Gastroenteritis*; *Malaria* being the highest with 9,936 cases reported in 1999, 16,088 in 2000, 13,206 in 2001 and 14,683 in 2002. In Trinidad and Tobago, for 1998-2004, cases of *Gastroenteritis* were most significant averaging 8,858 during the period.

Table 3.1: Number of Reported Cases and Incidence of Environmentally Related Diseases

Country	Year	Gastroenteritis			Typhoid			Malaria			Cholera		
		F	M	T	F	M	T	F	M	T	F	M	T
BS	1998	...	...	1,679	...	...	9	...	...	21	...	...	0
	1999	...	...	1,493	...	...	1	...	...	30	...	...	0
	2000	...	...	2,544	...	...	3	...	...	2	...	...	0
	2001	...	...	2,521	...	...	1	...	...	4	...	...	0
	2002	...	...	4,904	...	...	0	...	...	1	...	...	0
	2003	...	...	3,759	...	...	1	...	...	1	...	...	0
BZ	1998	1,227	1,284	2,511	0	1	1	816	1,170	1,986	17	9	26
	1999	411	529	940	0	0	0	835	1,018	1,853	5	7	12
	2000	406	493	899	0	0	0	655	831	1,486	0	0	0
	2001	313	390	703	0	0	0	503	660	1,163	0	0	0
	2002	134	159	293	0	0	0	485	628	1,113	0	0	0
	2003	236	240	476	0	1	1	550	774	1,324	0	0	0
	2004	1,550	1,455	3,005	2	1	3	466	599	1,065	0	0	0
DM	1998	27	29	56	5	5	10	1	1	2	...	...	...
	1999	33	25	58	1	2	3	0	0	0	...	...	...
	2000	9	7	16	0	0	0	0	1	1	...	...	...
	2001	15	40	55	1	0	1	0	1	1	...	...	...
	2002	120	117	237	0	2	2	0	0	0	...	...	...
	2003	78	57	135	1	1	2	0	0	0	...	...	...
	2004	54	64	118	0	0	0	0	0	0	...	...	...
GD	1999	...	...	2,571	...	...	0	...	...	0	...	...	0
	2000	...	...	1,532	...	...	0	...	...	0	...	...	0
	2001	...	...	1,513	...	...	0	...	...	0	...	...	0
	2002	...	...	1,058	...	...	0	...	...	0	...	...	0
	2003	...	...	1,566	...	...	0	...	...	0	...	...	0
	2004	...	...	1,376	...	...	0	...	...	0	...	...	0
VC	2000	1,312	1,179	2,491	...	...	...	...	...	0	...	...	0
	2001	1,144	987	2,131	...	...	...	...	...	0	...	...	0
	2002	844	691	1,535	...	...	...	...	...	0	...	...	0
	2003	1,974	1,813	3,787	...	...	...	...	...	0	...	...	0
	2004	1,093	1,028	2,121	...	...	...	...	...	0	...	...	0
SR	1998	...	...	(a) 6,672	...	...	(b) 12	...	...	(d) ...	...	...	0
	1999	...	...	5,875	...	...	2	...	...	...	...	...	0
	2000	...	...	5,871	...	...	0	...	...	9,936	...	...	...
	2001	...	...	7,557	...	...	2	...	...	16,088	...	...	...
	2002	...	...	7,645	...	...	0	...	...	13,206	...	...	...
	2003	...	...	5,246	...	...	...	...	...	14,683	...	...	...
	2004	...	...	...	...	...	...	...	...	...	...	...	...

Table 3.1 Contd. Number of Reported Cases and Incidence of Environmentally Related Diseases

Country	Year	Poisoning			Dengue			Accidental pesticide			Diarrhea		
		F	M	T	F	M	T	F	M	T	F	M	T
BS	1998	81	45	126	...	...	336	5	7	12	...	...	...
	1999	38	39	77	...	...	0	3	1	4	...	...	...
	2000	45	40	85	...	...	0	2	2	4	...	...	...
	2001	64	51	115	...	...	0	3	2	5	...	...	...
	2002	50	28	78	...	...	0	1	9	10	...	...	...
	2003	75	32	107	...	...	180	3	4	7	...	...	...
BZ	1998	20	2	22	...	...	...	3	3	6	1,268	1,346	2,614
	1999	23	23	46	2	4	6	0	8	8	431	559	990
	2000	14	21	35	2	2	4	1	1	2	428	507	935
	2001	16	30	46	2	2	4	3	3	6	343	426	769
	2002	24	35	59	25	16	41	7	15	22	143	170	313
	2003	19	36	55	5	2	7	2	16	18	293	283	576
	2004	18	39	57	24	17	41	2	9	11	1,624	1,544	3,168
DM	1998	...	...	...	...	...	...	...	...	...	15	4	19
	1999	...	...	...	...	...	...	...	...	...	5	3	8
	2000	...	...	...	...	...	...	...	...	...	4	1	5
	2001	...	...	...	...	...	...	...	...	...	1	1	2
	2002	...	...	...	...	...	...	...	...	...	12	5	17
	2003	...	...	...	...	...	...	...	...	...	12	7	19
	2004	...	...	...	...	...	...	...	...	...	6	4	10
GD	1999	...	...	0	...	...	29	...	...	0	...	...	452
	2000	...	...	0	...	...	16	...	...	0	...	...	517
	2001	...	...	0	...	...	19	...	...	0	...	...	446
	2002	...	...	0	...	...	282	...	...	0	...	...	423
	2003	...	...	0	...	...	21	...	...	0	...	...	533
	2004	...	...	0	...	...	8	...	...	0	...	...	380
VC	2000	...	...	...	2	1	3	...	...	...	...	...	...
	2001	...	...	...	2	1	3	...	...	...	...	...	...
	2002	...	...	...	54	75	129	...	...	...	...	...	...
	2003	...	...	...	1	2	3	...	...	...	...	...	...
	2004	...	...	...	2	2	4	...	...	...	...	...	...
SR	1998	...	...	(c) 198	...	...	(e)	...	...	...	...	...	...
	1999	...	...	16	...	...	...	...	...	...	...	...	...
	2000	...	...	8	...	...	1,093	...	...	...	...	...	...
	2001	...	...	8	...	...	516	...	...	...	...	...	...
	2002	...	...	3	...	...	446	...	...	...	...	...	...
	2003	...	...	...	...	...	218	...	...	...	...	...	...
	2004	...	...	...	...	...	...	...	...	...	...	...	...

Table 3.1 Contd. Number of Reported Cases and Incidence of Environmentally Related Diseases

Country	Year	Respiratory diseases			Other			TOTAL CASES, all causes		
		F	M	T	F	M	T	F	M	T
BS	1998	129	134	263	...	...	1,177	...	...	3,623
	1999	161	172	333	...	...	1,153	...	...	3,091
	2000	156	176	332	...	...	999	...	...	3,969
	2001	124	131	255	...	...	1,019	...	...	3,920
	2002	140	191	331	...	...	1,333	...	...	6,657
	2003	171	194	365	...	...	1,213	...	...	5,633
BZ	1998	375	439	814	...	...	...	4,101	4,693	8,794
	1999	370	430	800	...	...	...	2,447	3,008	5,455
	2000	408	515	923	...	...	...	2,322	2,885	5,207
	2001	392	505	897	...	...	...	1,964	2,521	4,485
	2002	360	442	802	...	...	...	1,538	1,907	3,445
	2003	463	548	1,011	...	...	...	2,031	2,448	4,479
	2004	413	434	847	...	...	...	4,512	4,532	9,044
DM	1998	...	...	0	...	...	...	48	39	87
	1999	...	...	0	...	...	...	39	35	74
	2000	...	...	0	...	...	...	13	9	22
	2001	...	...	0	...	...	...	17	42	59
	2002	12	19	31	...	...	...	132	124	256
	2003	...	...	0	...	...	...	91	65	156
	2004	...	...	0	...	...	...	60	68	128
GD	1999	...	...	8,560	...	...	...	...	...	11,612
	2000	...	...	9,654	...	...	...	...	...	11,719
	2001	...	...	6,954	...	...	...	...	...	8,932
	2002	...	...	9,503	...	...	...	...	...	11,266
	2003	...	...	9,170	...	...	...	...	...	11,290
	2004	...	...	7,698	...	...	...	...	...	9,462
VC	2000	...	...	...	...	...	...	...	...	...
	2001	...	...	...	...	...	...	...	...	...
	2002	...	...	...	...	...	...	...	...	...
	2003	...	...	...	...	...	...	...	...	...
	2004	...	...	...	...	...	...	...	...	...
SR	1998	...	...	...	...	...	...	...	...	...
	1999	...	...	...	...	...	...	...	...	...
	2000	...	...	...	...	...	...	...	...	...
	2001	...	...	...	...	...	...	...	...	...
	2002	...	...	...	...	...	...	...	...	...
	2003	...	...	...	...	...	...	...	...	...
	2004	...	...	...	...	...	...	...	...	...

Table 3.1 Contd. Number of Reported Cases and Incidence of Environmentally Related Diseases

Country	Year	Gastroenteritis			Typhoid			Malaria			Cholera		
		F	M	T	F	M	T	F	M	T	F	M	T
TT	1998	...	...	14,109	...	...	...	...	...	8	...	...	0
	1999	...	...	19,796	...	...	...	...	...	8	...	...	0
	2000	...	...	17,356	...	...	3	...	...	17	...	...	0
	2001	...	...	22,694	...	...	...	...	...	11	...	...	0
	2002	...	...	16,897	...	...	...	...	...	8	...	...	0
	2003	...	...	18,925	...	...	...	...	...	9	...	...	0
	2004	...	...	22,231	...	...	...	...	...	11	...	...	0
ASSOCIATE MEMBERS													
BM	1998	36	24	60	0	0	0	0	0	0	0	0	0
	1999	22	26	48	0	0	0	0	0	0	0	0	0
	2000	30	26	56	0	0	0	0	0	0	0	0	0
	2001	20	21	41	0	0	0	0	2	2	0	0	0
	2002	37	21	58	0	0	0	0	0	0	0	0	0
	2003	29	22	51	0	0	0	0	0	0	0	0	0
	2004	27	23	50	0	0	0	0	0	0	0	0	0
TC	1998	...	...	...	...	...	...	...	...	...	...	...	...
	1999	...	...	...	...	...	...	...	...	...	...	...	...
	2000	...	...	...	...	...	...	...	...	...	...	...	...
	2001	...	...	158	...	...	0	...	...	0	...	...	0
	2002	...	...	99	...	...	0	...	...	2	...	...	0
	2003	...	...	217	...	...	0	...	...	1	...	...	0
	2004	...	...	371	...	...	0	...	...	0	...	...	0

Table 3.1 Contd. Number of Reported Cases and Incidence of Environmentally Related Diseases

Country	Year	Poisoning			Dengue			Accidental pesticide			Diarrhoea		
		F	M	T	F	M	T	F	M	T	F	M	T
TT	1998	...	...	...	...	...	2,984	...	..	...	...	...	...
	1999	...	...	...	...	...	1,199	...	..	...	...	...	...
	2000	...	...	...	...	...	2,235	...	..	...	...	...	...
	2001	...	...	...	...	...	2,417	...	..	...	...	...	...
	2002	...	...	...	...	...	6,311	...	..	...	...	...	...
	2003	...	...	...	...	...	2,371	...	..	...	...	...	...
	2004	...	...	...	...	...	594	...	..	...	...	...	...
ASSOCIATE MEMBERS													
BM	1998	14	13	27	0	0	0	0	0	0	5	4	9
	1999	15	11	26	0	0	0	0	0	0	8	1	9
	2000	28	21	49	0	0	0	0	0	0	5	9	14
	2001	24	13	37	0	0	0	0	0	0	2	0	2
	2002	27	16	43	0	1	1	0	0	0	0	0	0
	2003	13	14	27	0	1	1	0	0	0	4	1	5
	2004	21	11	32	0	0	0	0	0	0	5	0	5
TC	1998	...	...	...	...	...	...	...	..	...	...	...	...
	1999	...	...	...	...	...	...	...	..	...	...	...	...
	2000	...	...	...	...	...	...	...	..	...	...	...	...
	2001	...	...	...	...	...	...	...	..	...	...	...	...
	2002	...	...	31	...	...	0	...	..	...	...	...	...
	2003	...	...	104	...	...	0	...	..	...	...	...	...
2004	...	...	172	...	...	0	...	..	...	...	...	...

Table 3.1 Contd. Number of Reported Cases and Incidence of Environmentally Related Diseases

Country	Year	Respiratory diseases			Other			TOTAL CASES, all causes		
		F	M	T	F	M	T	F	M	T
TT	1998	...	...	...	...	...	...	...	...	...
	1999	...	...	...	...	...	...	...	...	...
	2000	...	...	...	...	...	...	...	...	...
	2001	...	...	...	...	...	...	...	...	...
	2002	...	...	...	...	...	...	...	...	...
	2003	...	...	...	...	...	...	...	...	...
	2004	...	...	...	...	...	...	...	...	...
ASSOCIATE MEMBERS										
BM	1998	229	245	474	...	...	...	284	286	570
	1999	314	296	610	...	...	...	359	334	693
	2000	262	263	525	...	...	...	325	319	644
	2001	208	265	473	...	...	...	254	301	555
	2002	201	212	413	...	...	...	265	250	515
	2003	239	202	441	...	...	...	285	240	525
	2004	198	228	426	...	...	...	251	262	513
TC	1998	...	...	...	...	...	...	...	...	...
	1999	...	...	...	...	...	...	...	...	...
	2000	...	...	...	...	...	...	...	...	...
	2001	...	...	...	...	...	...	...	...	158
	2002	...	...	429	...	...	...	...	...	561
	2003	...	...	1,635	...	...	...	...	...	1,957
	2004	...	...	1,226	...	...	...	...	...	1,769

EH2: MDG 8: ENSURE ENVIRONMENTAL SUSTAINABILITY**Number of Households by Type of Sanitation facilities****Proportion of population with access to improved sanitation, urban and rural**

DK

Target 10: Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation**Concepts and Definitions**

The household is defined as follows: (a) a one-person household, defined as an arrangement in which one person makes provisions for his or her own food or other essentials for living without combining with any other person to form part of a multi-person household; and (b) a multi-person household, defined as a group of two or more persons living together who make common provisions for food or other essentials for living. The persons in the group may pool their incomes and have a common budget. They may be related or unrelated or a combination of both related and unrelated. (Please refer to the United Nations Principles and Recommendations for Population and Housing Censuses, Revision 1 (1997))

A *sanitary facility* is a unit for disposal of human excreta which isolates faeces from contact with people, animals, crops and water sources.

The number of households by sanitation facilities describes the types of toilet facilities available to households.

Types of Sanitation Facilities

W.C. Linked to Sewer: This is a flush toilet or water closet (W.C.), which fills from a piped water supply and empties into a sewerage disposal system.

W.C. Cesspit/Septic Tank is a waterborne toilet facility and empties into a cesspit or septic tank (a tank in which sewage is decomposed by the action of bacteria).

A *pit latrine* is a type of toilet facility that is available to the household outside of the dwelling. It is not waterborne.

None refers to households that are without sanitary facilities.

Other refers to all other sanitary facilities not so far mentioned.

Method of Computation

The number of households by sanitation facilities is classified from data obtained from Member States/Associate Members according to the categories: W.C. Linked to Sewer, W.C. Cesspit/Septic Tank, Pit latrine, None, Other and Not Stated as defined under the concepts and definition.

Indicator Relevance

The number of households by type of sanitation facilities is a basic indicator useful for assessing human health as it is a measure of the number of households that have access to basic/improved sanitary facilities. Accessibility to adequate excreta disposal facilities is fundamental to decreasing the faecal risk and the frequency of associated environmental diseases.

Data Assessment

Definitions for this indicator were not provided by Member States/Associate Members and therefore the degree of harmonisation is impossible to assess.

Data Sources

Please refer to **Appendix 1.3.2 (a)** for the sources of the data on the number of households by type of sanitation facilities of Member States and Associate Members.

Evaluation

The data presented in *Tables 3.2 (a) and (b)* shows that the *W.C. Cesspit/Septic Tank* was the most commonly used sanitation facility in the Region with 44.6 per cent of all households followed by the *Pit Latrine* with 33.6 per cent. 2.3 per cent of households in the Region reported no sanitation facility. Among Member States, Barbados reported the highest percentage of households using the *W.C. Cesspit/Septic Tank* as the most commonly used sanitation facility at 81.3 per cent followed by St. Kitts and Nevis with 78.1 per cent of households. Bermuda reported 90 per cent of households using the *W.C. Cesspit/Septic Tank* as the most used sanitation facility among Associated Members and this was the highest reported percentage in the Region.

In the Region only 17 per cent of households were linked to a *sewerage disposal system* and this was highest in Anguilla (89.9 per cent) followed by Antigua and Barbuda (72.7 per cent).

The *Pit Latrine* was most common in Guyana where more than 57.6 per cent of households reportedly used this method of sanitation followed by St. Vincent and the Grenadines (44.3 per cent) and Belize (44 per cent).

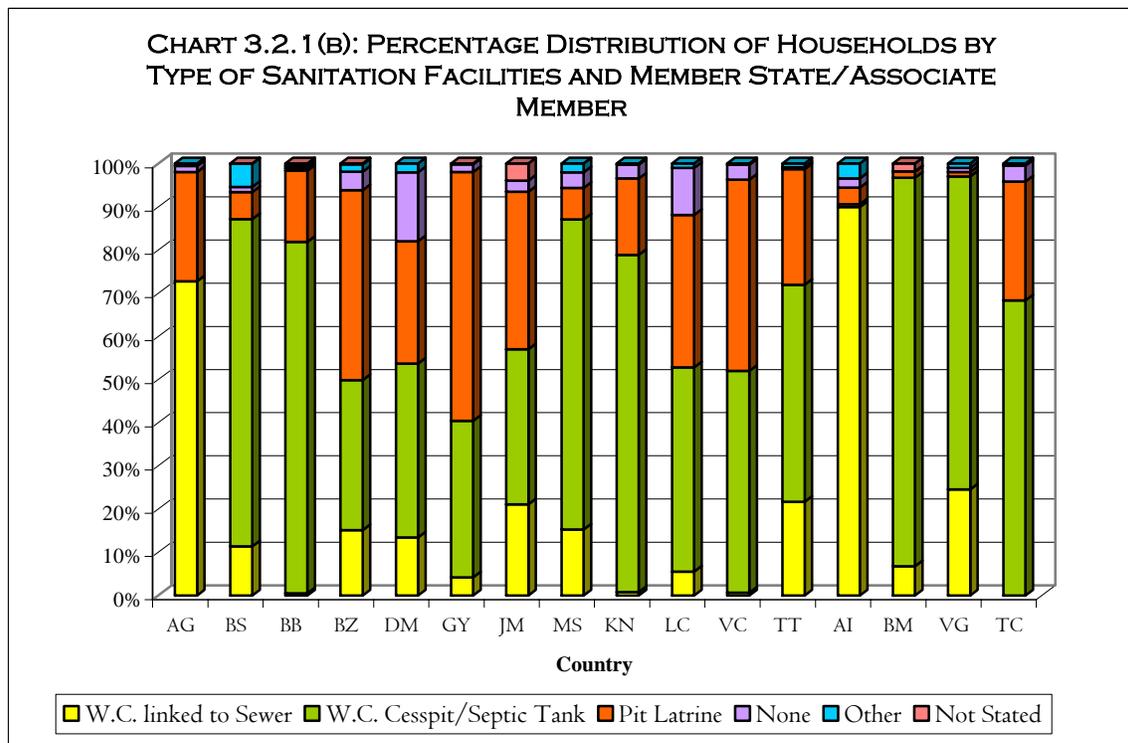
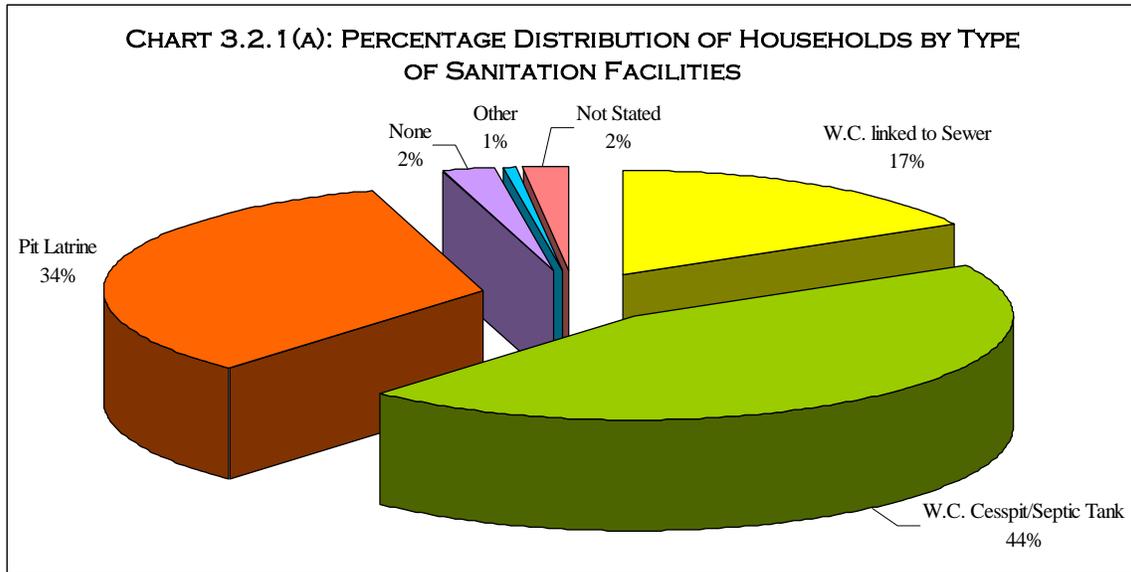
In Dominica, 16 per cent of households reported no sanitation facility followed by Saint Lucia where 10.9 per cent of households reported no sanitation facility.

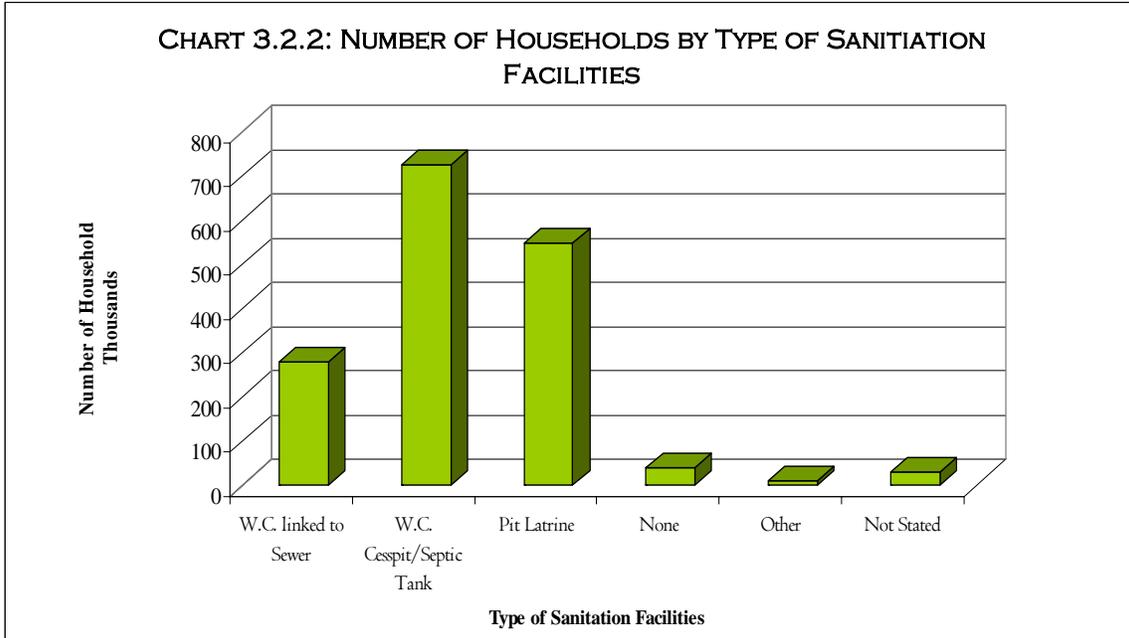
Table 3.2 (a) – Number of Households by Type of Sanitation facilities: 2000 Round of Census

Country	Year	W.C. Linked to sewer	W.C. Cesspit / Septic Tank	Pit Latrine	None	Other	Not Stated	Total all Households
AG	2001	14,868	0	5,176	293	113	0	20,450
BS	2000	9,978	66,507	5,445	1,054	4,703	55	87,742
BB	2000	428	67,511	13,684	487	453	463	83,026
BZ	2000	7,851	18,049	22,864	2,222	847	112	51,945
DM	2001	3,010	8,991	6,332	3,572	454	0	22,359
GY	2002	7,630	66,182	105,223	3,292	202	80	182,609
JM	2001	157,851	268,783	273,086	18,978	0	29,628	748,326
MS	2001	355	1,673	170	84	47	0	2,329
KN	2001	124	12,239	2,774	499	44	0	15,680
LC	2001	2,333	20,224	15,072	4,652	417	0	42,698
VC	2001	189	15,549	13,408	1,046	70	0	30,262
TT	2000	65,851	152,713	81,318	1,320	2,669	0	303,871
TOTAL MEMBER STATES		270,468	698,421	544,552	37,499	10,019	30,338	1,591,297
ASSOCIATE MEMBERS								
AI	2001	3,354	25	144	78	129	0	3,730
VG	2001	2,056	6,079	88	77	86	0	8,386
TC	2001	0	4,954	2,000	267	33	0	7,254
TOTAL ASSOCIATE MEMBERS		6,648	27,669	2,481	422	270	329	37,819
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		277,116	726,090	547,033	37,921	10,289	30,667	1,629,116

Table 3.2 (b) – Percentage distribution of Households by Type of Sanitation facilities: 2000 Round of Census

Country	Year	W.C. Linked to sewer	W.C. Cesspit / Septic Tank	Pit Latrine	None	Other	Not Stated	Total all Households
AG	2001	72.7	0.0	25.3	1.4	0.6	0.0	100.0
BS	2000	11.4	75.8	6.2	1.2	5.4	0.1	100.0
BB	2000	0.5	81.3	16.5	0.6	0.5	0.6	100.0
BZ	2000	15.1	34.7	44.0	4.3	1.6	0.2	100.0
DM	2001	13.5	40.2	28.3	16.0	2.0	0.0	100.0
GY	2002	4.2	36.2	57.6	1.8	0.1	0.0	100.0
JM	2001	21.1	35.9	36.5	2.5	0.0	4.0	100.0
MS	2001	15.2	71.8	7.3	3.6	2.0	0.0	100.0
KN	2001	0.8	78.1	17.7	3.2	0.3	0.0	100.0
LC	2001	5.5	47.4	35.3	10.9	1.0	0.0	100.0
VC	2001	0.6	51.4	44.3	3.5	0.2	0.0	100.0
TT	2000	21.7	50.3	26.8	0.4	0.9	0.0	100.0
TOTAL MEMBER STATES		17.0	43.9	34.2	2.4	0.6	1.9	100.0
ASSOCIATE MEMBERS								
AI	2001	89.9	0.7	3.9	2.1	3.5	0.0	100.0
VG	2001	24.5	72.5	1.0	0.9	1.0	0.0	100.0
TC	2001	0.0	68.3	27.6	3.7	0.5	0.0	100.0
TOTAL ASSOCIATE MEMBERS		17.6	73.2	6.6	1.1	0.7	0.9	100.0
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		17.0	44.6	33.6	2.3	0.6	1.9	100.0





EH3: MDG 8: ENSURE ENVIRONMENTAL SUSTAINABILITY

Number of Households by Type of Water Supply
Proportion of population with sustainable access to an improved water source, urban and rural

H

Target 10: Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation

Concept and Definition

The household is defined as follows: (a) a one-person household, defined as an arrangement in which one person makes provisions for his or her own food or other essentials for living without combining with any other person to form part of a multi-person household; and (b) a multi-person household, defined as a group of two or more persons living together who make common provisions for food or other essentials for living. The persons in the group may pool their incomes and have a common budget. They may be related or unrelated or a combination of both related and unrelated. (Please refer to the United Nations Principles and Recommendations for Population and Housing Censuses, Revision 1 (1998))

Water Supply refers to the water available to a community or region and the source and delivery system of that water.

The number of households by type of water supply describes the main source of water available to households.

Types of Water Supply

Piped into dwelling refers to the water supply received by a household from a private source that is piped into the dwelling unit through water pipes within the walls that constitute a dwelling.

Piped into yard describes a situation where the household receives running water from a public source through a pipe in the yard or compound on which the dwelling stands.

Public piped into dwelling describes a situation where running water from a public source is piped directly into the dwelling unit.

Private catchments: not piped occurs where the water supply to the household is from a private source within the premises and is not piped into the dwelling.

Private catchments: piped occurs where the water supply to the household is from a private source piped into the dwelling unit.

Public standpipe: This describes a situation where water is available to the household from a standpipe in the street or elsewhere, but not in the compound on which the dwelling stands.

Public well or tank applies when the water available to the dwelling unit is from a protected well or tank built by the public authorities or community-based, non-governmental organizations.

Other refers to any source other than those listed above (e.g. river, stream, spring, creek, etc).

Method of Computation

The number of households by type of water supply is classified from data obtained from Member States/Associate Members according to the categories: Piped into dwelling, Piped into yard, Public piped into dwelling, Private catchments: not piped, Private catchments: piped, Public catchments: piped, Public standpipe, Public well or tank and Other as defined above.

Indicator Relevance

The number of households by type of water supply provides a measure of the number of households that have access to safe water. Accessibility to safe water is of fundamental significance to reducing the risk and frequency of the spread of environmental diseases, especially in infants and the elderly who are more prone to picking up these diseases.

Data Assessment

It was assumed that the concepts of a household and of water supply are in accordance with the international definition and is harmonized across the region since no definitions were provided by the reporting Member States/Associate Members.

The degree of harmonisation for this indicator is difficult to assess since definitions were not provided by reporting Member States and Associate Members.

Data Sources

Please refer to **Appendix 1.3.3 (a)** for the sources of the data on the number of households by type of water supply of Member States and Associate Members.

Evaluation

Table 3.3 (a) indicated that 607,530 households (37.3 per cent) of the total 1,629,116 households in the Region had public water supply which was *pipied into dwelling*. When added to households with private water

supply *piped into dwelling* (303,913 households) this represented a combined percentage of 56 per cent. Among Member States, St. Kitts and Nevis and Barbados reported the highest number of households at 91.7 per cent and 90.9 per cent with water supply *piped into dwelling*. Among Associate Members, Bermuda recorded 95.9 per cent of households which had water supply *piped into dwelling*.

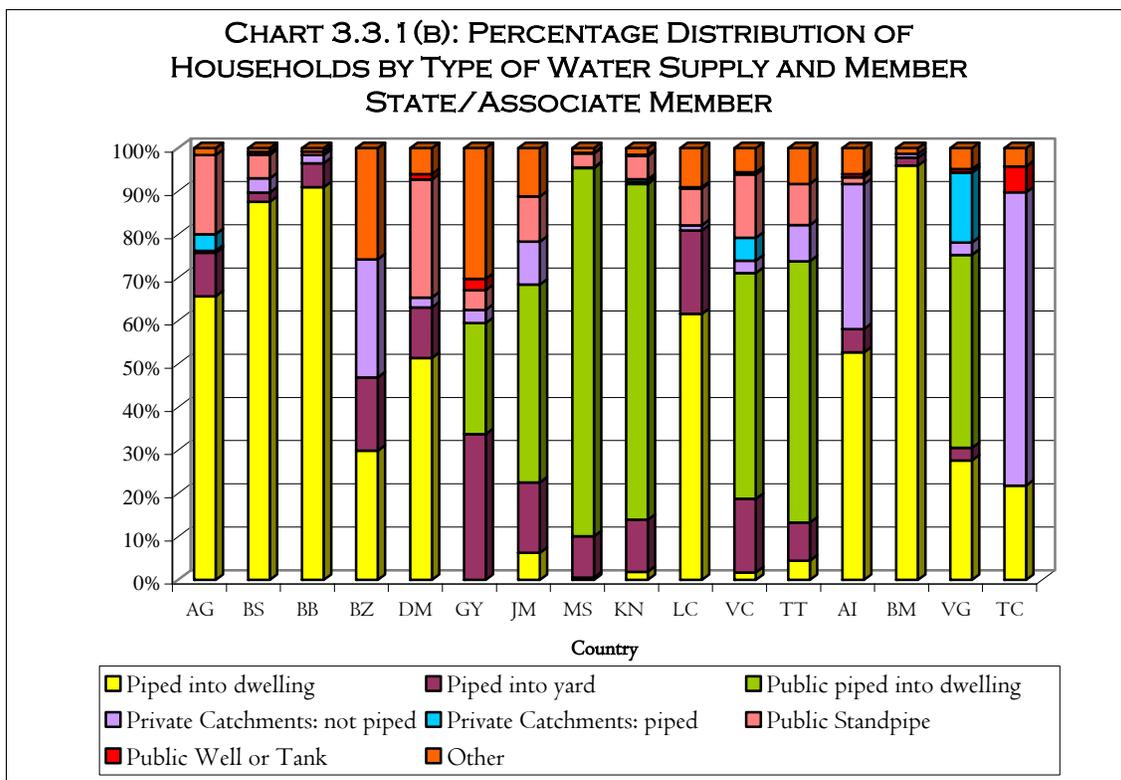
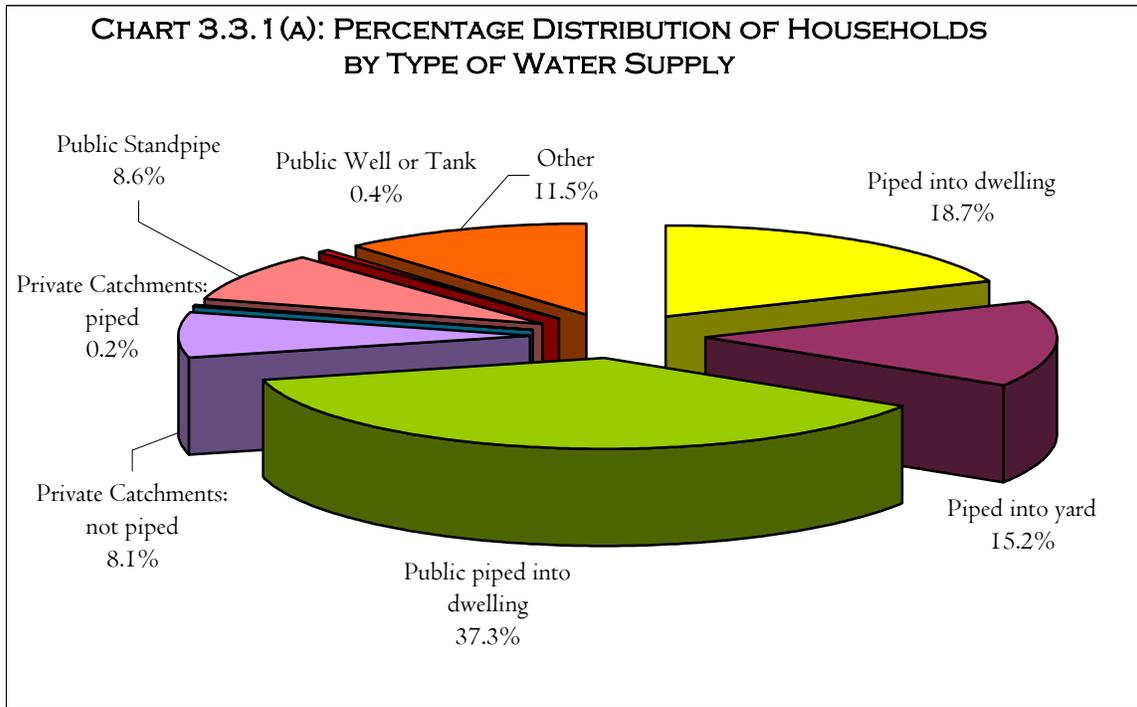
Improved drinking water sources as defined by the United Nations include household connection, public standpipe, borehole, protected dug well, protected spring and rainwater collection. Unimproved drinking water sources include unprotected well, unprotected spring, rivers or ponds, vendor-provided water, bottled water and tanker/truck water. Guyana and Belize recorded percentages of unimproved drinking water sources above 25 per cent.

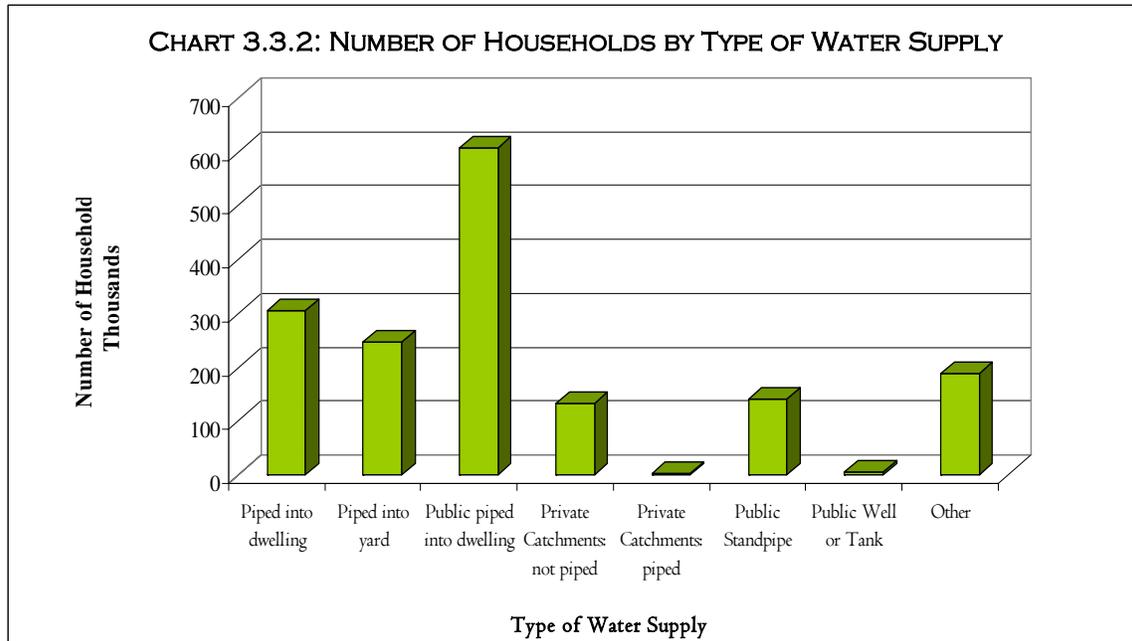
Table 3.3(a) Number of Households by Type of Water Supply: 2000 Round of Census

Country	Year	Piped into dwelling	Piped into yard	Public Piped into dwelling	Private catchments		Public standpipe	Public well or tank	Other	Total
					Not piped	Piped				
AG	2001	13,438	2,054	98	0	780	3,750	0	330	20,450
BS	2000	76,841	1,866	0	2,877	0	4,794	589	775	87,742
BB	2000	75,494	4,636	0	1,592	0	614	8	682	83,026
BZ	2000	15,548	8,828	0	14,190	0	0	0	13,379	51,945
DM	2001	11,495	2,615	0	516	0	6,109	277	1,347	22,359
GY	2000	0	61,638	46,984	5,549	0	8,331	4,792	55,315	182,609
JM	2001	46,830	122,133	342,723	74,445	0	78,467	0	83,728	748,326
MS	2001	13	222	1,987	1	2	75	3	26	2,329
KN	2001	295	1,887	12,196	70	98	843	48	243	15,680
LC	2001	26,308	8,259	0	508	0	3,636	140	3,847	42,698
VC	2001	521	5,167	15,826	864	1,599	4,438	158	1,689	30,262
TT	2000	13,561	26,777	183,966	25,341	0	29,057	0	25,169	303,871
TOTAL MEMBER STATES		280,344	246,082	603,780	125,953	2,479	140,114	6,015	186,530	1,591,297
ASSOCIATE MEMBERS										
AI	2001	1,965	203	0	1,251	0	59	26	226	3,730
VG	2001	2,320	244	3,750	241	1,356	8	60	407	8,386
TC	2001	1,584	n.a.	0	4,927	0	...	434	309	7,254
TOTAL ASSOCIATE MEMBERS		23,568	790	3,750	6,578	1,356	67	520	1,190	37,819
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		303,912	246,872	607,530	132,531	3,835	140,181	6,535	187,720	1,629,116

Table 3.3 (b) Percentage distribution of Households by Type of Water Supply: 2000 Round of Census

Country	Year	Piped into dwelling	Piped into yard	Public Piped into dwelling	Private catchments		Public standpipe	Public well or tank	Other	Total
					Not piped	Piped				
AG	2001	65.7	10.0	0.5	0.0	3.8	18.3	0.0	1.6	100.0
BS	2000	87.6	2.1	0.0	3.3	0.0	5.5	0.7	0.9	100.0
BB	2000	90.9	5.6	0.0	1.9	0.0	0.7	0.0	0.8	100.0
BZ	2000	29.9	17.0	0.0	27.3	0.0	0.0	0.0	25.8	100.0
DM	2001	51.4	11.7	0.0	2.3	0.0	27.3	1.2	6.0	100.0
GY	2000	0.0	33.8	25.7	3.0	0.0	4.6	2.6	30.3	100.0
JM	2001	6.3	16.3	45.8	9.9	0.0	10.5	0.0	11.2	100.0
MS	2001	0.6	9.5	85.3	0.0	0.1	3.2	0.1	1.1	100.0
KN	2001	1.9	12.0	77.8	0.4	0.6	5.4	0.3	1.5	100.0
LC	2001	61.6	19.3	0.0	1.2	0.0	8.5	0.3	9.0	100.0
VC	2001	1.7	17.1	52.3	2.9	5.3	14.7	0.5	5.6	100.0
TT	2000	4.5	8.8	60.5	8.3	0.0	9.6	0.0	8.3	100.0
TOTAL MEMBER STATES		17.6	15.5	37.9	7.9	0.2	8.8	0.4	11.7	100.0
ASSOCIATE MEMBERS										
AI	2001	52.7	5.4	0.0	33.5	0.0	1.6	0.7	6.1	100.0
VG	2001	27.7	2.9	44.7	2.9	16.2	0.1	0.7	4.9	100.0
TC	2001	21.8	n.a.	0.0	67.9	0.0	...	6.0	4.3	100.0
TOTAL ASSOCIATE MEMBERS		62.3	2.1	9.9	17.4	3.6	0.2	1.4	3.1	100.0
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		18.7	15.2	37.3	8.1	0.2	8.6	0.4	11.5	100.0





Appendix 1.3

1.3.1 (a): Sources of Data for Table 3.1 - Number of Reported Cases and Incidence of Environmentally Related Diseases: 1998 - 2004

Country	Data Source
THE BAHAMAS	Items 1-5, 10: Department of Public Health; Items 6-9: Public Hospitals Authority- Kean Information System (Princess Margaret Hospital and Rand Memorial Hospital discharge data)
BELIZE	The Epidemiology Unit, Ministry of Health
DOMINICA	Ministry of Health
GRENADA	Central Statistical Office
ST VINCENT AND THE GRENADINES	Statistical Office
SURINAME	Bureau of Public Health
TRINIDAD AND TOBAGO	Central Statistics Office
BERMUDA	Inpatient discharges
THE TURKS AND CAICOS ISLANDS	Primary Health Care Department and Medical Department, Ministry of Health

1.3.1 (b): Notes for Table 3.1 - Number of Reported Cases and Incidence of Environmentally Related Diseases: 1998 - 2004

Country	Notes
GRENADA	Total: Total amount of cases for that given year
BERMUDA	ICN-9-CM classification was used. In order to provide accurate data, a detailed description of the diagnosis must be provided.
SURINAME	(a) Telephone calls. (b) Hospital surveillance (confirmed). (c) Hospital. (d) Confirmed cases. (e) Suspected cases.
THE TURKS AND CAICOS ISLANDS	Malaria refers to imported cases of malaria. Poisoning refers to cases of poisoning from food borne diseases. Diarrhoea is included in gastroenteritis. Respiratory diseases refers to acute infections <5 yrs. Data not collected at the source by sex.

1.3.2 (a): Source of Data for Table 3.2 - Number of Households by Type of Sanitation: 2000 Round of Census

Country	Data Source
ANTIGUA AND BARBUDA	Basic Table Volumes
THE BAHAMAS	Population and Housing Census, 2000 Round
BARBADOS	2000 Population and Housing Census, Volume1, Barbados Statistical Service
BELIZE	Population and Housing Census, 2000 Round
DOMINICA	Central Statistical Office and 2001 Population and Housing Census
GUYANA	Basic Table Volumes
JAMAICA	Population Census Country Report 2001. Volume 1. Statistical Institute of Jamaica
MONTserrat	Basic Table Volumes
ST. KITTS AND NEVIS	Basic Table Volumes
SAINT LUCIA	Population and Housing Census 2001
ST VINCENT AND THE GRENADINES	Basic Table Volumes
TRINIDAD AND TOBAGO	Population and Housing Census 2000 Round
ANGUILLA	Population and Housing Census 2000 Round
BRITISH VIRGIN ISLANDS	Basic Table Volumes
THE TURKS AND CAICOS ISLANDS	TCI Standard of Living Assessment Report, 1999; Preliminary Population and Housing Census Report 2001

1.3.2 (b): Notes for Table 3.2 - Number of Households by Type of Sanitation: 2000 Round of Census

Country	Notes
BELIZE	Don't Know is included in Not Stated
JAMAICA	Not Stated includes "availability and type not reported". For each category of sanitation facility, "shared" and "not shared" were combined
TRINIDAD AND TOBAGO	Other includes not stated

1.3.3 (a): Sources of Data for Table 3.3 - Number of Households by Type of Water Supply: 2000 Round of Census

Country	Data Source
ANTIGUA AND BARBUDA	Basic Table Volumes
THE BAHAMAS	Population and Housing Census, 2000 Round
BARBADOS	2000 Population and Housing Census, Volume1, Barbados Statistical Service
BELIZE	Central Statistical Office
DOMINICA	Central Statistical Office and 2001 Population and Housing Census
GUYANA	Basic Table Volumes
JAMAICA	Population Census Country Report. Volume 1. Statistical Institute of Jamaica
MONTSERRAT	Basic Table Volumes
ST. KITTS AND NEVIS	Basic Table Volumes
SAINT LUCIA	Population and Housing Census 2001
ST VINCENT AND THE GRENADINES	Basic Table Volumes
TRINIDAD AND TOBAGO	Population and Housing Census, 2000 Round
ANGUILLA	Population and Housing Census, 2000 Round
BRITISH VIRGIN ISLANDS	Basic Table Volumes
THE TURKS AND CAICOS ISLANDS	TCI Standard of Living Assessment Report, 1999; Preliminary Population and Housing Census Report 2001

1.3.3 (b): Notes for Table 3.3 - Number of Households by Type of Water Supply: 2000 Round of Census

Country	Notes
THE BAHAMAS	Other includes not stated. Rain water is included in piped into dwelling, but can be either piped into dwelling or into yard.
BARBADOS	Other includes not stated. Private catchments, not piped refer to friend/relative's pipe. Piped into dwelling is disaggregated by Public or Private Piped into dwelling. Public piped is the government water system and private piped is the individual household private water system. Public Piped = 48962 and private piped = 26796. The cumulative is given.
BELIZE	Other includes not stated
DOMINICA	Other includes not stated. Urban connections (Roseau + Environs) = 8977
GUYANA	Public Piped into Dwelling = public piped into dwelling + private piped into dwelling
SAINT LUCIA	Other includes not stated
ST VINCENT AND THE GRENADINES	Other includes private catchment piped
TRINIDAD AND TOBAGO	Other includes truck borne and not stated
ANGUILLA	Other includes not stated
BERMUDA	This question was discontinued after the 1980 Population and Housing Census as 96% of private dwelling units had piped water. Other includes not stated.
THE TURKS AND CAICOS ISLANDS	Other includes not stated.

ND1: NATURAL DISASTERS BY YEAR**PH****Concept and Definition**

A *disaster* is a situation or event, which overwhelms local capacity, necessitating a request to the national or international level for external assistance or an unforeseen and often sudden event that causes great damage, destruction and human suffering. (Please refer to *International Strategy for Disaster Reduction's website at <http://www.unisdr.org/disaster-statistics/introduction.htm>*.)

A *natural disaster* is a physical natural event that kills people or overwhelms local capacity for damage control or recovery. Natural disasters include avalanches, floods, hurricanes, tropical storms, earthquakes, cyclones, torrential rains, volcanic eruptions, typhoons, droughts, landslides, mudslides, fires, blizzards and tsunamis, to name a few.

Categories

Dead refers to persons confirmed dead and persons missing and presumed dead.

Injured refers to people suffering from physical injuries, trauma or an illness requiring medical treatment as a direct result of a disaster.

Missing: A person is considered missing when someone reports to the police that they are not reasonably aware of the whereabouts of the missing person since the disaster struck.

Homeless: These are persons who are in need of immediate assistance in the form of shelter as a consequence of a disaster.

Affected people: People requiring immediate assistance during a period of emergency, i.e. requiring basic survival needs such as food, water, shelter, sanitation and immediate medical assistance

Damages refer to the economic impacts that disasters usually have on the local economy. The consequences of the disaster may be either direct (damage to infrastructure, crops, housing, etc) or indirect (loss of revenues, unemployment, market destabilisation, etc).

International Agreed Glossary of Basic Terms Related to Disaster Management (1992)
UN-DHA, IDNDR, Geneva

Method of Computation

The date that the disaster started establishes the date when the disaster occurred. For sudden-impact disasters, the date that the disaster started is the onset date, while for gradually developing disasters, the date that the disaster started is the date of the first call for national or international assistance. The *starting date* for disasters that develop over

time is gathered from scientific and governmental sources. The *disaster type* may be classified as sudden onset (such as earthquakes and floods) or long-term onset (such as drought). In addition, two or more disasters may be related or other disasters may occur as a consequence of a primary event. In cases such as these, each disaster is counted and recorded individually.

The *total population affected* covers all casualties, as well as individuals whose basic requirements for food, shelter, water, sanitation and medical attention are adversely affected.

Damages refer to the value of all damages and economic losses directly related to the occurrence of a disaster. There is no standard procedure for determining the global figure for the economic impacts of a disaster, but the host government, the United Nations and other major non-governmental organizations quantify the losses using methodologies that have been developed specifically for their domain.

Indicator Relevance

Natural disasters cause loss of life; disruption of economic activities and urban productivity; major resettlement of populations; and environmental change, such as loss of fertile agricultural land and water contaminations. In addition, the growing vulnerability of populations (population pressures on land, increasing urbanization and risky land use, marginalization of populations, civil unrest, etc) implies that the impacts of disaster events are becoming greater. At the same time, decreasing national and donor budgets to the prevention of natural disasters reflect the need for better planning, preparedness and coordination.

The value of this indicator is a function of the different factors that define the risk of death and damage, that is, the frequency of events; the size of the population and capital in the affected area; and the capacity of the local population and government to prevent or respond to future disasters. The indicator, natural disasters by year, also lends itself for use in development assessment that takes into account the yearly changes in the aforementioned areas.

Data Assessment

Of the eighteen (18) Member States and Associate Members in the Community who submitted data under the CARICOM Programme, nine (9), provided data for this indicator. The nine (9) countries were The Bahamas, Belize, Dominica, Guyana, Jamaica, Saint Lucia, Trinidad and Tobago, Bermuda and The Turks and Caicos Islands. The data provided by these countries for this indicator were sparse and contained numerous gaps.

Usually, when two or more disasters are related or other disasters occur as a consequence of a primary event, each disaster is counted and recorded individually. Dominica reported three concurrent hurricanes in 1995 as one natural disaster.

Data Sources

Data for this indicator were obtained from the Central Statistical Offices of the individual Member States and Associate Members. Details are given in **Appendix 2.4.1**.

Evaluation

Table 4.1 shows the natural disasters occurring in the Region by year and type and other variables. Data was reported for seven Member States and two Associate Members. The most common types of disasters occurring in the Region were *hurricanes* and *flooding*.

Among Member States, Jamaica reported ten (10) events since 1991 of which flooding and earthquakes were most common. A tropical storm in 1994 affected 4 families and flooding in 1995 affected 416 families while torrential rains in 1998 left 3 persons dead. Flooding damages were estimated at US\$24.9 million in 1991, US\$7.1 million in 1995, US\$3.2 million in 1993 while an earthquake in 1993, a tropical storm in 1994 and torrential rains in 1998 caused an estimated total of US\$7 million in damages.

Trinidad and Tobago also reported ten (10) events consisting eight (8) floods, one (1) earthquake and one (1) Hurricane. Floods occurred in 1990, 1991, 1993, 1996, 1999, 2000, 2002 and 2004 leaving 18 casualties among which 16 persons died and 2 persons were injured. Damages from the floods were an estimated US\$43.8 million throughout the period with the heaviest damage estimated at US\$31.9 million in 2004. The earthquake in 1997 caused US\$2.9 million in damages with no reported casualties while the Hurricane in 2004 affected 1,000 persons of which 22 persons were left homeless and one fatality. Damages from this hurricane were estimated to be US\$4.9 million.

Nine (9) disasters were reported for Saint Lucia including three (3) Tropical Waves in 1996, 1998 and 2003, two (2) Tropical Storms in 1994 and 2002, two (2) hurricanes which occurred in 1999 and 2004 and two (2) landslides. The highest reported casualties in this Member State were, 125 families homeless after the Tropical storm in 2002 followed by 102 families homeless after the 1999 Landslip, 49 persons homeless after the 1999 Landslide, 3 families homeless and 1 fatality following the Tropical Wave in 1998. Natural disasters caused an estimated US\$107.7 million in damages with the highest (US\$85.2 million) reported in 1994 after the tropical storm.

The Bahamas reported seven (7) hurricanes disasters from 1992 to 2004 which left 6 persons dead, 4 in 1992, 1 in 1999 and another in 2004. Persons affected by flooding, power outage or general inconvenience totalled 1,143,862 ranging from 16,443 persons after Hurricane Lili in October 1996 to 303,611 following Hurricane Floyd in September 1999. The estimated damages following Hurricanes Frances and Jeanne in 2004 totalled US\$200 million with Hurricanes Frances reportedly the most expensive.

Dominica reported six (6) natural disasters including four (4) Hurricanes in 1979, 1989, 1995 and 1999, one (1) tropical storm in 1994 and one (1) Earthquake/Landslide in 2004. The Hurricane in 1979 caused devastation to 75,000 persons leaving 60,000 homeless,

3,000 injured and 42 dead and an estimated US\$32.2 million in damages. Three (3) hurricanes in 1995 left one fatality and US\$135.6 million in damages while the hurricane in 1999 displaced 602 persons and caused US\$11.5 million in damages. The Earthquake/Landslide in 2004 left 19,527 persons homeless and caused an estimated US\$33.3 million worth of damages. In the Central American region, Belize reported Hurricane Keith in 2000 and Hurricane Iris in 2001 where a total of 93,289 persons were affected and damages estimated at US\$380 million. Among the casualties of Hurricane Mitch were 3,279 homeless and 10 dead while Hurricane Iris left 5 persons injured and 23 persons dead. Guyana reported one (1) flood in 2005 which left 34 persons dead and 354,718 persons affected.

During the period 1960 to 2004, Associate Member The Turks and Caicos Islands reported seven (7) disasters which included four (4) Tropical storms occurring in 1995, 2001, 2003 and 2004 and three (3) Hurricanes in 1960, 1985 and 2004. Bermuda reported one (1) disaster, Hurricane Fabian in 2003 which affected 50,000 persons, leaving 4 persons dead and causing an estimated US\$300 million in damages.

Table 4.1 - Natural Disasters by year: 1960 – 2005

Country	Year	Disasters			Total casualties					Total population affected (number)	Affected persons by flooding, power outage, or general inconvenience	Damage (US\$ million)
		Type of disaster	Name of disaster	Date started	Total	Dead	Injured	Missing	Homeless			
BS	1992	Hurricane	Andrew	17-Aug	...	4	...	0	...	...	192,596	...
	1995	Hurricane	Erin	31-Jul	...	0	...	0	...	...	60,203	...
	1996	Hurricane	Lili	18-Oct	...	0	...	0	...	...	16,443	...
	1999	Hurricane	Floyd	13-Sep	...	1	...	0	...	...	303,611	...
	2001	Hurricane	Michelle	4-Nov	...	0	...	0	...	...	227,567	...
	2004	Hurricane	Frances	1-Sep	...	1	...	0	...	...	283,278	150,000,000.00
	2004	Hurricane	Jeanne	25-Sep	...	0	...	0	...	...	60,164	50,000,000.00
BZ	2000	Hurricane	Mitch	28-Oct	3,289	10	...	...	3,279	57,400	...	280.00
	2001	Hurricane	Iris	08-Oct	28	23	5	0	0	35,889	...	99.50
DM	1979	Hurricane	...	29-Aug	63,042	42	3,000	...	60,000	75,000	...	32.15
	1989	Hurricane	...	17-Sept	...	...	...	...	...	...	...	25.56
	1994	Tropical Storm	...	...	...	...	...	...	...	...	...	11.11
	1995	Hurricane	...	27-Aug 05-Sept	...	1	...	...	...	...	...	135.56
	1999	Hurricane	...	18-Sept	...	...	...	...	...	602	...	11.48
	2004	Earthquake/ Landslide	...	21-Nov	...	0	...	0	...	19,527	...	33.33
GY	2005	Floods	...	16-Jan	...	34	...	...	...	354,718	...	...
JM	1991	Flooding	...	...	...	0	...	...	...	...	...	24.87
	1992	Earthquake	...	...	...	0	...	...	...	...	...	...
	1993	Flooding	...	...	...	0	...	...	...	...	...	3.21
	1993	Earthquake	...	...	...	0	...	...	...	...	...	0.62
	1994	Tropical storms	...	...	...	0	...	...	4 families	...	...	0.11
	1995	Flooding	...	...	...	0	...	...	416 families	...	...	7.07
	1996	Flooding	...	Nov	...	...	...	...	...	...	...	...
	1996	Landslides	...	...	...	...	...	...	...	...	...	...
	1996	Earthquakes	...	...	...	...	...	...	...	...	...	...
	1998	Torrential rains	...	...	...	3	...	...	...	0	...	6.30

Table 4.1 Contd. Natural Disasters by year: 1960 – 2005

Country	Year	Disasters			Total casualties					Total population affected (number)	Affected persons by flooding, power outage, or general inconvenience	Damage (US\$ million)
		Type of disaster	Name of disaster	Date started	Total	Dead	Injured	Missing	Homeless			
LC	1994	Tropical Storm	...	09-Dec	...	3	...	...	...	...	...	85.19
	1996	Tropical Wave	...	26-Oct	...	0	...	...	...	...	...	4.44
	1998	Landslide	...	14-Oct	49	0	...	...	49	...	...	...
	1998	Tropical Wave	...	21-Oct	...	1	...	...	3 families	...	...	0.23
	1999	Landslip	...	01-Sep	...	0	...	...	102 families	...	...	0.37
	1999	Hurricane	...	09-Nov	...	0	...	...	...	...	...	6.26
	2002	Tropical Storm	...	22-Sep	...	0	...	...	125	...	...	7.52
	2003	Tropical Wave	...	07-Jul	...	0	...	...	0	...	...	1.14
2004	Hurricane	...	09-Sep	...	0	...	...	0	...	...	2.59	
TT	1990	Flood	...	15-Dec	2	2	...	...	...	...	...	1.65
	1991	Flood	...	08-Mar	1	1	...	...	...	...	...	...
	1993	Flood	...	10-May	6	6	...	...	...	...	...	...
	1996	Flood	...	23-Jul	3	3	...	...	...	...	...	...
	1997	Earthquake	...	22-Apr	...	...	...	...	...	...	...	2.88
	1999	Flood	...	16-Aug	1	1	...	...	...	...	...	...
	2000	Flood	...	26-Nov	...	...	...	...	...	...	...	...
	2002	Flood	...	11-May	...	...	...	...	...	...	...	10.30
	2004	Hurricane	...	11-Jul	23	1	...	...	22	1000	...	4.90
2004	Flood	...	11-Dec	5	3	2	...	...	...	...	31.89	
ASSOCIATE MEMBERS												
BM	2003	Hurricane	Fabian	09-May	4	4	...	...	...	50000	...	300.00
TC	1960	Hurricane	Donna	...	...	...	...	...	...	...	...	...
	1985	Hurricane	Kate	...	...	...	...	...	...	...	...	...
	1995	Tropical Storm	Erin	...	0	0	0	0	0	0	...	...
	2001	Tropical Storm	Dean	Aug	0	0	0	0	0	0	...	...
	2003	Tropical Storm	Mindy	Oct	0	0	0	0	0	0	...	...
	2004	Hurricane	Frances	Sep	0	0	0	0	0	0	...	...
	2004	Tropical Storm	Jeanne	Sep	0	0	0	0	0	0	...	...

Appendix 1.4 Exchange Rates

1.4.1 National Currency Per United States Dollar

COUNTRY	NATIONAL CURRENCY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
THE BAHAMAS	Bahamas Dollar - B\$	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
BARBADOS	Barbados Dollar - Bd\$	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
BELIZE	Belize Dollar - BZ\$	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
GUYANA	Guyana Dollar - G\$	48.26	118.54	124.95	126.85	138.89	141.85	140.05	141.93	150.46	177.07
JAMAICA	Jamaica Dollar - J\$	7.18	12.76	22.89	25.58	33.16	35.35	36.88	35.48	36.52	39.18
SURINAME	Suriname Guilder - Sf	1.79	1.79	1.79	74.12	201.05	412.00	406.00	406.00	406.00	995.00
TRINIDAD AND TOBAGO	Trinidad and Tobago Dollar - TT\$	4.25	4.25	4.25	5.34	5.87	5.89	5.99	6.25	6.28	6.27
OECS COUNTRIES	EC\$	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70

1.4.1 Contd. National Currency Per United States Dollar partitions

COUNTRY	NATIONAL CURRENCY	2000	2001	2002	2003	2004	2005	2006
THE BAHAMAS	Bahamas Dollar - B\$	1.00	1.00	1.00	1.00	1.00	1.00	1.00
BARBADOS	Barbados Dollar - Bd\$	2.00	2.00	2.00	2.00	2.00	2.00	2.00
BELIZE	Belize Dollar - BZ\$	2.00	2.00	2.00	2.00	2.00	2.00	2.00
GUYANA	Guyana Dollar - G\$	181.01	187.11	190.60	195.34	199.79	199.88	201.09
JAMAICA	Jamaica Dollar - J\$	43.19	46.10	48.07	58.24	60.99	61.99	65.87
SURINAME	Suriname Guilder - Sf	1339.20	2200.00	2349.98	2628.33	2733.58	2.73	2.74
TRINIDAD AND TOBAGO	Trinidad and Tobago Dollar - TT\$	6.28	6.20	6.21	6.26	6.27	6.27	6.28
OECS COUNTRIES	EC\$	2.70	2.70	2.70	2.70	2.70	2.70	2.70

Notes:

Guyana: 1991-2002 are average annual Market Exchange mid-rates.
 Jamaica: Mid rates calculated from the Purchases and Sales rates
 Trinidad and Tobago: TT/US rates are mid-rates (average of buying and selling rates)

Sources:

Guyana: 1991-2002 Statistical Bulletin (BOG)
 Jamaica: Statistical Digest, Dec 94, Sep 95, Dec 96, Dec 97, Dec 98, Nov 99, May 2000, Jan 2003(BOJ)
 Trinidad and Tobago: 1980-1985: Central Bank of Trinidad and Tobago
 1986-1998: The Balance of Payments of Trinidad & Tobago, 1991, 1998 (Central Bank of T&T)
 1999-2001 www.central-bank.org.tt
 2002 www.central-bank.org.tt (TT Dollar Exchanges Rates)
 Annual Economic Survey 2004
 Jamaica: Bank Of Jamaica Website, http://www.boj.org.jm/exchange_rates_annual.php

Appendix 2.4

2.4.1 (a) Sources of Data for Table 4.1 - Natural Disasters by Year: 1960 - 2005

Country	Data Source
THE BAHAMAS	Bahamas Department of Meteorology and Department of Statistics
BELIZE	Land Information Centre and Ministry of Natural Resources
DOMINICA	Disaster Coordinating Unit and OECS Macro-socio Economic Assessment
GUYANA	Bureau of Statistics
JAMAICA	Statistical Institute of Jamaica
SAINT LUCIA	National Emergency Management Office
TRINIDAD AND TOBAGO	Central Statistical Office
BERMUDA	Department of Statistics
THE TURKS AND CAICOS ISLANDS	Hurricane Command Centre

2.4.1 (b) Notes for Table 4.1 - Natural Disasters by Year: 1960 - 2005

Country	Notes
DOMINICA	A combined assessment was done for the landslide and earthquake in 2004 since the occurrence was about the same time.
BERMUDA	Total population affected represents only persons in households who lost electricity.

EM1: ENERGY CONSUMPTION BY TYPE AND YEAR**H****Concepts and Definitions**

Energy consumption refers to all the energy used for heat, power, and electricity generation, regardless of where the energy was produced.

Types of Fuels

Solid fuels include hard coal, lignite, peat, patent fuel, lignite briquettes, peat briquettes, coke and bituminous sands.

Liquid fuels include crude oil, natural gas liquids, plant condensate, gasoline, petroleum products, jet fuel, kerosene, liquefied petroleum gas, refinery gas, feedstock, naphtha, lubricants, gas/diesel oils and residual (heavy) fuel oils and bitumen.

Gaseous fuels include natural gas and other petroleum gases, such as gasworks gas, coke oven gas and blast furnace gas.

Primary electricity refers to electricity generated by noncombustible energy sources and includes electrical energy of geothermal, hydro, nuclear, tide, wind, wave/ocean and solar origin.

Traditional fuels include estimates of the consumption of charcoal, fuel wood and bagasse.

- *Charcoal* is solid residue consisting mainly of carbon and obtained by the destructive distillation of wood in the absence of air.
- *Fuel wood* is all wood in the rough that is used for fuel purposes.
- *Bagasse* is the cellulosic residue left after sugar is extracted from sugar cane.

Energy Statistics: Definitions, Units of Measure, and Conversion Factors (see http://unstats.un.org/unsd/publication/SeriesF/SeriesF_44E.pdf [last accessed: July 2nd 2009]).

Method of Computation

The data on energy consumption refer to the apparent energy consumption of the population. The data is derived using the formula:

$$\text{Energy consumption} = \text{energy production} + \text{energy imports} - \text{energy exports} - \text{bunkers} \\ \pm \text{stock changes}$$

Indicator Relevance

Energy use is a key aspect of consumption and production. Traditionally, energy has been regarded as the engine of

economic progress. However, its production, consumption, and by-products have resulted in major impacts on the environment. Energy consumption by year and type, therefore, gives an indication of the amount and types of fuel used in a year which allows for crucial estimations of the environmental impacts.

Moreover, energy consumption by type and year gives an indication of the amount of fossil fuels used in any given year. This is important since consumption of fossil fuels is a major contributor to global warming and air pollution. Fossil fuel resources should be conserved to support long term development and to reduce the negative environmental impacts. Consumption of fossil fuels can be reduced by regulating energy prices, which will internalise environmental and social costs, manage demand, encourage the development of alternative renewable energy sources, and hence, reduce the negative environmental impacts resulting from the consumption of fossil fuels.

Fuel consumption is highly dependent on urban land use density and the fuel efficiency of the vehicle fleet. Increasing fuel consumption may be the consequence of suburbanization of the work force, increasing income and car ownership, and reduction of passenger numbers per vehicle. This indicator, energy consumption by type and year, also provides, therefore, indirect information about urban congestion and contamination of land and water.

Data Assessment

The concept of energy consumption by type and year is harmonized across the region since all reporting Member States followed the internationally recommended definition of energy consumption.

Of the fourteen (14) Member States who usually provide data, only eight (8) provided data for this indicator and the data provided were sparse with very little detail. In addition, only one of the Associate Members of the Community provided data for this indicator.

Data Sources

Please refer **Appendix 1.5.1** for the sources of the data on the energy consumption of Member States/Associate Members by type and year.

Evaluation

The Bahamas, Dominica and Jamaica reported consumption of *liquid fuels* as shown in **Table 5.1**. In 1990, The Bahamas reported 1.8 million barrels of fuel compared to 3.7 million barrels in 2003. Consumption of *liquid fuels* grew for the years 1998 (2.5 million barrels), 1999 (2.8 million barrels) and 2000 (3.6 million barrels) but declined in 2001 to 3.4 million barrels and increased thereafter to 3.6 million barrels in 2002 and further to 3.7 million barrels in 2003.

In Dominica 27.3 thousand cubic metres of *liquid fuels* (*Kerosene, Diesel and Gasoline*) were consumed in 1990 compared to 98 thousand cubic metres in 2004 representing an increase of 27.9 per cent. 1.8 million cubic metres of *liquid fuels* was reported in 1995, a very significant increase as compared to the period 1999 to 2003, when average consumption was recorded at 43 thousand cubic metres.

Jamaica reported 22.8 million barrels of fuel in 1998 as compared to the provisional estimate of 26.2 million barrels in 2004. The average consumption of *liquid fuels* for this Member State during the period 1998 to 2004 stood at 24.2 million barrels of fuel with the largest quantity consumed in 2005 (25.5 million barrels).

An analysis of *Gaseous Fluids* in **Table 5.1** for reporting countries, Dominica and Grenada, reveals that in 1995, Dominica consumed 1.3 million kilograms of gaseous fuels compared to 1.9 million kilograms in 2004. The highest consumption for Dominica was recorded in 1999 at 2.7 million kilogram with an average consumption of 2.0 million kilogram for the years 1990, 1995, 1998 to 2004. For Grenada, a reported consumption of 26.7 Imperial gallons of gaseous fuels for 2002 compared to 27.8 Imperial gallons in the following year representing an increase of 4 per cent.

Eight (8) Member States and Associate Members reported on the consumption of *primary electricity*, all of which showed increases in usage over the period for which data was submitted. The Bahamas reported 770 thousand megawatt-hour (MWh) consumption in 1990 compared to 1,462 thousand MWh in 2003, a 94.8 per cent increase in consumption over the period. Belize reported 153 thousand MWh in 1995 compared to 308 thousand MWh in 2003, an increase of 101.3 per cent, over the period. Dominica reported 31 thousand MWh in 1990 compared to 66 thousand MWh in 2004, an increase of 116.3 per cent. For the period 1999 to 2004, primary electricity consumption in Grenada increased by 19.3 per cent from 105 thousand metric tonnes in 1999 to 126 thousand metric tons in 2004. Jamaica reported 1,998 thousand MWh consumption in 1995 which increased by 48.8 per cent to 2,974 thousand MWh in 2004, based on the provisional estimate submitted. Saint Lucia reported 197 thousand MWh consumption in 1995 compared to 309 thousand MWh in 2004, an increase of 56.9 per cent. St Vincent and the Grenadines reported 42 thousand MWh consumption in 1990 compared to 106.5 thousand MWh in 2004 to an increase of more than one and a half times or 152 per cent. Bermuda was the only Associate Member that submitted data for this indicator. In 1999 this country reported 522 thousand MWh consumption compared to 590 thousand MWh in 2003, an increase of 12.9 per cent.

For traditional fuels Belize and Jamaica were the only two countries to submit data. Belize submitted data for 2002 on the use of *fuelwood* and *bagasse*. Jamaica reported 224 thousand of barrels oil equivalent of *charcoal* consumption in 2000 compared to 196 thousand of barrel oil equivalent, a drop of 14.3 per cent in 2004, based on the provisional estimate provided. The data showed that the consumption fluctuated, increasing in 2001 (227 thousand of barrel oil equivalent) and 2002 (230 thousand of barrel oil equivalent) when compared to 2000 followed by a decrease in consumption in 2003 (207 thousand of barrel oil equivalent) and 2004 (196 thousand of barrel oil

equivalent). In 2000, Jamaica reported 681 thousands of barrel oil equivalent consumption of *fuel wood* compared to 585 thousands of barrel oil equivalent in 2004, a provisional estimate. *Fuelwood* consumption reported also fluctuated for the period of data reported; showing an increase of 1.9 per cent from 2000 to 2001 followed a decline of 15.7 per cent to the end of the period. The consumption of *bagasse* increased by 11.7 per cent in 2001 compared to 2000 (650 thousands of barrel of oil equivalent) followed by declines of 8.7 per cent in 2002 and 9.5 per cent in 2003 and an increase of 15.9 per cent in 2004, based on a provisional estimate.

Table 5.1 - Energy consumption by type and year: 1990, 1995, 1998-2004

Country	Year	Solid Fuels	Liquid Fuels	Gaseous Fuels	Primary electricity	Traditional fuels		
						Charcoal	Fuelwood	Bagasse
BS			'000 barrels		MWh			
	1990	...	1,775	...	770,000	n/a	n/a	n/a
	1995	...	2,698	...	949,000	n/a	n/a	n/a
	1998	...	2,486	...	1,130,000	n/a	n/a	n/a
	1999	...	2,776	...	1,219,000	n/a	n/a	n/a
	2000	...	3,618	...	1,281,000	n/a	n/a	n/a
	2001	...	3,460	...	1,343,000	n/a	n/a	n/a
	2002	...	3,598	...	1,399,000	n/a	n/a	n/a
2003	...	3,661	...	1,462,000	n/a	n/a	n/a	
BZ					MWh	tonne	m ³	tonne
	1995	...	...	...	152,931	...	...	...
	1998	...	...	...	186,731	...	...	...
	1999	...	...	...	198,799	...	...	...
	2000	...	...	...	229,352	...	...	...
	2001	...	...	...	256,715	...	...	...
	2002	...	...	...	278,946	...	118,244	286,127
	2003	...	...	...	307,553	...	...	...
DM			m ³	'000 kgs	MWh			
	1990	...	27,322	1,295	30,697	...	...	...
	1995	...	1,830,163	1,567	45,125	...	...	...
	1998	...	...	2,133	57,294	...	...	...
	1999	...	42,060	2,699	60,594	...	...	...
	2000	...	46,181	2,318	62,005	...	...	...
	2001	...	43,775	2,040	63,914	...	...	...
	2002	...	38,751	2,300	64,194	...	...	...
	2003	...	45,305	2,147	62,735	...	...	...
2004	...	97,968	1,940	66,419	...	...	...
GD				Imperial gallons	tonne			
	1999	...	...	...	105,210	...	...	...
	2000	...	...	...	113,348	...	...	...
	2001	...	...	...	123,918	...	...	...
	2002	...	...	26,676	129,214	...	...	...
	2003	...	...	27,765	138,292	...	...	...
2004	...	...	...	125,511	...	...	...
JM			'000 barrels ^{a/}		MWh	'000 boe	'000 boe	'000 boe
	1995	...	...	...	1,998,000	...	...	...
	1998	...	22,797	...	...	...	...	...
	1999	...	23,423	...	2,576,200	...	...	...
	2000	...	23,824	...	2,738,900	224	681	650
	2001	...	23,766	...	2,793,300	227	694	726
	2002	...	24,790	...	2,896,500	230	650	663
	2003	...	25,500	...	2,998,300	207	650	600
2004p	...	25,180	...	2,974,000	196	585	695	
LC					MWh			
	1995	...	...	...	196,574	...	...	...
	1998	...	...	...	235,881	...	...	...
	1999	...	...	...	256,195	...	...	...
	2000	...	...	...	276,745	...	...	...
	2001	...	...	...	286,539	...	...	...
	2002	...	...	...	285,713	...	...	...
	2003	...	...	...	298,983	...	...	...
2004	...	...	...	308,540	...	...	...

Table 5.1 - Energy consumption by type and year: 1990, 1995, 1998-2004

Country	Year	Solid Fuels	Liquid Fuels	Gaseous Fuels	Primary electricity	Traditional fuels		
						Charcoal	Fuelwood	Bagasse
VC					MWh			
	1990	...	...	...	42,269	...	...	...
	1995	...	...	...	62,141	...	...	...
	1998	...	...	...	74,598	...	...	...
	1999	...	...	...	77,900	...	...	...
	2000	...	...	...	82,049	...	...	...
	2001	...	...	...	86,604	...	...	...
	2002	...	...	...	89,824	...	...	...
	2003	...	...	...	95,430	...	...	...
2004	...	...	...	106,523	...	...	...
ASSOCIATE MEMBERS								
BM					MWh			
	1999	...	...	...	522,470	...	...	...
	2000	...	...	...	535,335	...	...	...
	2001	...	...	...	553,920	...	...	...
	2002	...	...	...	574,726	...	...	...
2003	...	...	...	590,032	...	...	...

EM2: MDG 8: ENSURE ENVIRONMENTAL SUSTAINABILITY**Number of Households by Type of Fuel used for cooking****Proportion of population using solid fuels****H**

Target 9: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources

Concepts and Definitions

The household is defined as follows: (a) a one-person household, defined as an arrangement in which one person makes provisions for his or her own food or other essentials for living without combining with any other person to form part of a multi-person household; and (b) a multi-person household, defined as a group of two or more persons living together who make common provisions for food or other essentials for living. The persons in the group may pool their incomes and have a common budget. They may be related or unrelated or a combination of both related and unrelated. (Please refer to the *United Nations Principles and Recommendations for Population and Housing Censuses, Revision 1 (1997)*.)

Fuel is defined as combustible matter used to maintain fire, such as coal, wood, oil, or gas, in order to create heat or power.

Fuel used for cooking refers to the fuel used predominantly for the preparation of principal meals.

The number of households by type of fuel used for cooking describes the types of fuels that households use for cooking.

Types of Cooking Fuel

Charcoal is a solid residue that consists mainly of carbon and is obtained by the destructive distillation of wood in the absence of air.

Wood refers to all wood in the rough that is used for fuel.

Liquefied Petroleum Gas (LPG)/Gas is a combination of hydrocarbons (propane, butane and ethane) which are gaseous under conditions of normal temperature and pressure, but are liquefied by compression or cooling to facilitate storage, handling and transportation.

Kerosene is medium oil that is distilled between 150°C and 300°C. It is used as an illuminant and as a fuel and is often referred to as burning oil, vaporizing oil, power kerosene or illuminating oil.

Electricity is an electric current used as a source of power.

Other refers to types of cooking fuel not mentioned above.

Method of Computation

The number of households by type of fuel used for cooking is classified from data obtained from Member States/Associate Members according to the categories: None, Charcoal, Wood, LPG/Gas, Kerosene, Electricity, Not Stated and Other.

Indicator Relevance

The proportion of households using solid fuels is one of the indicators for monitoring the Millennium Development Goals. There are important linkages between household solid fuel use, indoor air pollution, deforestation, soil erosion and greenhouse gas emissions. The type of fuel and its participation in cooking tasks are important predictors of exposure to indoor air pollution.

Data Assessment

The number of households by type of fuel used for cooking was obtained from data submitted by Member States/Associate Members. All reporting countries followed the internationally recommended concept of fuel used for cooking. This indicator is, therefore, regionally and internationally conceptually harmonized.

Data Sources

Please refer to **Appendix 1.5.2** for the sources of the data on the number of households in Member States/Associate Members by type of fuel used for cooking.

Evaluation

Tables 5.2(a) and **5.2(b)** present the number of households by type of fuel used for cooking for the 2000 Round of Census in the CARICOM Region. The total number of households for the thirteen (13) reporting Member States was 1.7 million of which *LPG/Gas* (78.3 per cent) was the preferred type of fuel used for cooking. Other significant types of fuel used in Member States were, *Wood* (6.3 per cent), *Kerosene* (5.4 per cent) and *Charcoal* (4.2 per cent) and *Electricity* (3.1 per cent). Three (3) Associate Members consisting 19,370 households, reported 77.8 per cent of households using *LPG/Gas* as the main type of fuel used for cooking followed by *Electricity* (18.9 per cent).

Six (6) Member States and two (2) Associate Members reported *LPG/Gas* usage above 90 per cent with Antigua and Barbuda reporting the highest among Member States at 95.7 per cent followed by Montserrat with 94.8 per cent. The British Virgin Islands reported the highest percentage of households using *LPG/Gas* for cooking at 94.1 among Associate Members followed by Anguilla (93 per cent).

Table 5.2 (a) Number of Households by Type of Fuel used for Cooking: 2000 Round of Census

Country	Year	Charcoal	Wood	LPG/Gas	Kerosene	Electricity	None	Not Stated	Other	Total
AG	2001	318	88	19,612	34	135			263	20,450
BS	2000	293	388	65,126	898	19,563			1,474	87,742
BB	2000	72		65,172	1,883	2,491		2,257	11,151	83,026
DM	2001	3,510		18,054	308	67			420	22,359
GD	2001	943	1,319	30,611	205	61			337	33,476
GY	2002	1,143	23,982	71,660	82,158	2,600		110	956	182,609
JM	2001	36,148	80,686	597,578	3,009	11,958			18,947	748,326
MS	2001	38	41	2,207	3	11			29	2,329
KN	2001	159	233	14,521	140	393			234	15,680
LC	2001	5,702		40,055	94	189			1,084	47,124
VC	2001	1,182	917	27,318	128	317			400	30,262
SR	2004	19,941		97,166	916	993		3,329	1,118	123,463
TT	2000	2,237		282,408	1,555	13,219	1,710	2,435	307	303,871
TOTAL MEMBER STATES		71,686	107,654	1,331,488	91,331	51,997	1,710	8,131	36,720	1,700,717
ASSOCIATE MEMBERS										
AI	2001	51		3,469	3	45		127	35	3,730
VG	2001	21	6	7,894	5	403			57	8,386
TC	2001	217	0	3,712	112	3,213		0	0	7,254
TOTAL ASSOCIATE MEMBERS		289	6	15,075	120	3,661	0	127	92	19,370
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		71,975	107,660	1,346,563	91,451	55,658	1,710	8,258	36,812	1,720,087

Table 5.2 (b) Percentage Distribution of Households by Type of Fuel used for Cooking: 2000 Round of Census

Country	Year	Charcoal	Wood	LPG/Gas	Kerosene	Electricity	None	Not Stated	Other	Total
AG	2001	1.6	0.4	95.9	0.2	0.7			1.3	100.0
BS	2000	0.3	0.4	74.2	1.0	22.3			1.7	100.0
BB	2000	0.1		78.5	2.3	3.0		2.7	13.4	100.0
DM	2001	15.7		80.7	1.4	0.3			1.9	100.0
GD	2001	2.8	3.9	91.4	0.6	0.2			1.0	100.0
GY	2002	0.6	13.1	39.2	45.0	1.4		0.1	0.5	100.0
JM	2001	4.8	10.8	79.9	0.4	1.6			2.5	100.0
MS	2001	1.6	1.8	94.8	0.1	0.5			1.2	100.0
KN	2001	1.0	1.5	92.6	0.9	2.5			1.5	100.0
LC	2001	12.1		85.0	0.2	0.4			2.3	100.0
VC	2001	3.9	3.0	90.3	0.4	1.0		0.0	1.3	100.0
SR	2004	16.2		78.7	0.7	0.8		2.7	0.9	100.0
TT	2000	0.7		92.9	0.5	4.4	0.6	0.8	0.1	100.0
TOTAL MEMBER STATES		4.2	6.3	78.3	5.4	3.1	0.1	0.5	2.2	100.0
ASSOCIATE MEMBERS										
AI	2001	1.4		93.0	0.1	1.2	0.0	3.4	0.9	100.0
VG	2001	0.3	0.1	94.1	0.1	4.8			0.7	100.0
TC	2001	3.0	0.0	51.2	1.5	44.3		0.0	0.0	100.0
TOTAL ASSOCIATE MEMBERS		1.5	0.0	77.8	0.6	18.9	0.0	0.7	0.5	100.0
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		4.2	6.3	78.3	5.3	3.2	0.1	0.5	2.1	100.0

CHART 5.2.1 (A): PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY TYPE OF FUEL USED FOR COOKING

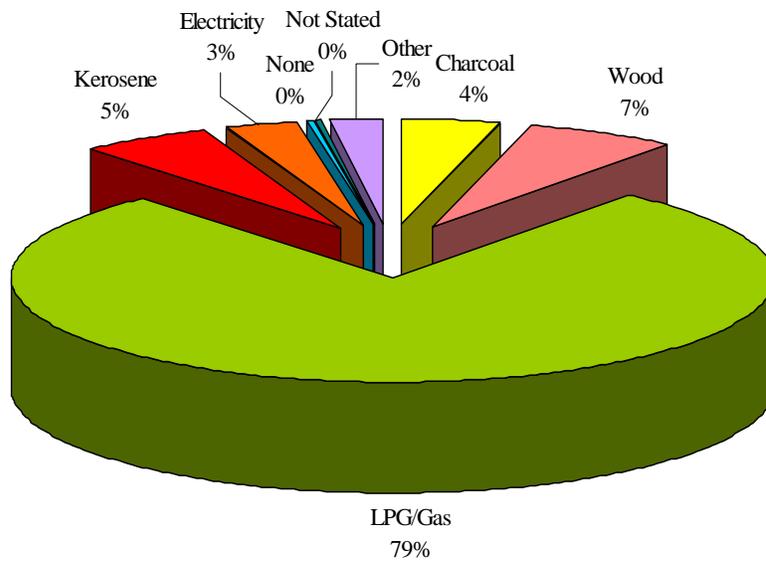
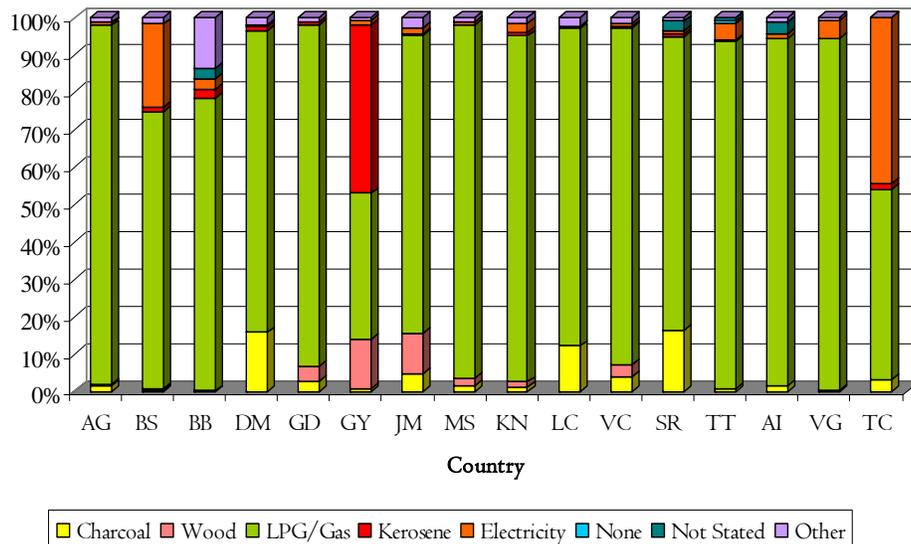
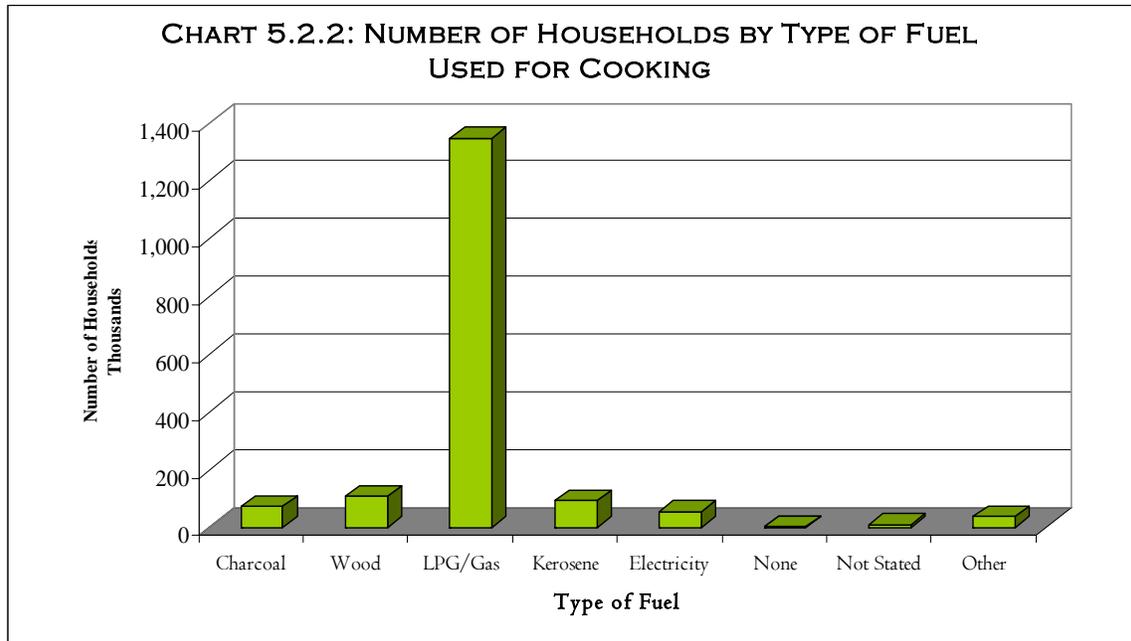


CHART 5.2.1 (B): PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY TYPE OF FUEL USED FOR COOKING AND MEMBER STATE/ASSOCIATE MEMBER





EM3: NUMBER OF HOUSEHOLDS BY TYPE OF FUEL USED FOR LIGHTING**H****Concepts and Definitions**

The household is defined as follows: (a) a one-person household, defined as an arrangement in which one person makes provisions for his or her own food or other essentials for living without combining with any other person to form part of a multi-person household; and (b) a multi-person household, defined as a group of two or more persons living together who make common provisions for food or other essentials for living. The persons in the group may pool their incomes and have a common budget. They may be related or unrelated or a combination of both related and unrelated. (*Please refer to the United Nations Principles and Recommendations for Population and Housing Censuses, Revision 1 (1997).*)

Type of lighting refers to the source of lighting predominantly used by occupants of a housing unit.

The number of households by type of lighting describes the types of fuels that members of households use for lighting.

Types of Fuel Used for Lighting

Gas is a combination of hydrocarbons (propane, butane and ethane) which are gaseous under conditions of normal temperature and pressure, but are liquefied by compression or cooling to facilitate storage, handling and transportation.

Kerosene is medium oil that is distilled between 150°C and 300°C. It is used as an illuminant and as a fuel and is often referred to as burning oil, vaporizing oil, power kerosene or illuminating oil.

Electricity is an electric current used as a source of power.

Other is other types of lighting fuel not so far mentioned.

Method of Computation

Data for this indicator were obtained from Member States/Associate Members according to the categories: Gas, Kerosene, Electricity, Not Stated and Other as defined under concepts and definitions.

Indicator Relevance

Household lighting energy use is increasing due to the construction of larger homes and the installation of more light

fittings per home. Most homes could probably reduce the amount of energy they use for lighting by 50 percent or more. The average household's energy use is responsible for about eight tonnes of carbon dioxide (CO₂), the main greenhouse gas, per year

Data Assessment

The number of households by type of fuel used for lighting was obtained from data submitted by Member States/Associate Members. All reporting countries followed the internationally recommended concept of fuel used for lighting. This indicator is, therefore, regionally and internationally conceptually harmonized.

Data Sources

Please refer to **Appendix 1.5.3** for the sources of the data on the number of households in Member States/Associate Members by type of fuel used for lighting.

Evaluation

Tables 5.3 (a) and (b) revealed that *electricity* provided lighting to 86.7 per cent of the 1.6 million households in the Region. *Kerosene* followed with 165,301 or 10.3 per cent of households reporting use of this type of fuel for lighting. The percentage use of *electricity* was higher for Associate Member States which reported 96.8 per cent of households as compared to 86.6 per cent of households for Member States. Among Associate Members, 99.2 per cent of households in The British Virgin Islands reportedly used *electricity* as the main type of fuel used for lighting whilst among Member States, 96.5 percent of Barbados households used this type of fuel for lighting. Guyana reported the lowest proportion of households using *electricity* as the main source of lighting although this Member State reported the highest proportion of households using *kerosene* as their main source of lighting. A small percentage of households in the Region (0.8 per cent) used *Gas* for lighting although Guyana reported 5.4 per cent of households using this type of fuel as the main source of lighting.

Table 5.3 (a) Number of Households by Type of Fuel used for lighting: 2000 Round of Census

Country	Year	Gas	Kerosene	Electricity	Other	Not Stated	Total All Households
AG	2001	61	564	19,236	421	168	20,450
BS	2000	837	0	84,115	2,790	0	87,742
BB	2000	69	1,807	80,126	465	559	83,026
BZ	2000	1,068	6,859	42,417	1,488	113	51,945
DM	2001	58	1,764	19,237	1,300	0	22,359
GD	2001	58	3,720	28,885	813	0	33,476
GY	2002	9,821	44,301	124,874	3,411	202	182,609
JM	2001	0	79,066	651,405	17,855	0	748,326
MS	2001	0	24	2,233	46	26	2,329
KN	2001	54	655	14,665	177	129	15,680
VC	2001	71	3,877	24,940	1,113	261	30,262
TT	2000	711	22,392	277,413	1,546	1,809	303,871
TOTAL MEMBER STATES		12,808	165,029	1,369,546	31,425	3,267	1,582,075
ASSOCIATE MEMBERS							
AI	2001	1	95	3,491	33	110	3,730
VG	2001	30	11	8,320	18	7	8,386
TC	2001	21	167	6,938	128	0	7,254
TOTAL ASSOCIATE MEMBERS		42	272	18,760	179	117	19,370
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		12,850	165,301	1,388,306	31,604	3,384	1,601,445

Table 5.3 (b) Percentage distribution of Households by Type of Fuel used for lighting: 2000 Round of Census

Country	Year	Gas	Kerosene	Electricity	Other	Not Stated	Total All Households
AG	2001	0.3	2.8	94.1	2.1	0.8	100.0
BS	2000	1.0	0.0	95.9	3.2	0.0	100.0
BB	2000	0.1	2.2	96.5	0.6	0.7	100.0
BZ	2000	2.1	13.2	81.7	2.9	0.2	100.0
DM	2001	0.3	7.9	86.0	5.8	0.0	100.0
GD	2001	0.2	11.1	86.3	2.4	0.0	100.0
GY	2002	5.4	24.3	68.4	1.9	0.1	100.0
JM	2001	0.0	10.6	87.0	2.4	0.0	100.0
MS	2001	0.0	1.0	95.9	2.0	1.1	100.0
KN	2001	0.3	4.2	93.5	1.1	0.8	100.0
VC	2001	0.2	12.8	82.4	3.7	0.9	100.0
TT	2000	0.2	7.4	91.3	0.5	0.6	100.0
TOTAL MEMBER STATES		0.8	10.4	86.6	2.0	0.2	100.0
ASSOCIATE MEMBERS							
AI	2001	0.0	2.5	93.6	0.9	2.9	100.0
VG	2001	0.4	0.1	99.2	0.2	0.1	100.0
TC	2001	0.3	2.3	95.6	1.8	0.0	100.0
TOTAL ASSOCIATE MEMBERS		0.3	1.4	96.8	0.9	0.6	100.0
TOTAL MEMBER STATES AND ASSOCIATE MEMBERS		0.8	10.3	86.7	2.0	0.2	100.0

CHART 5.3.1(A): PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY TYPE OF FUEL USED FOR LIGHTING

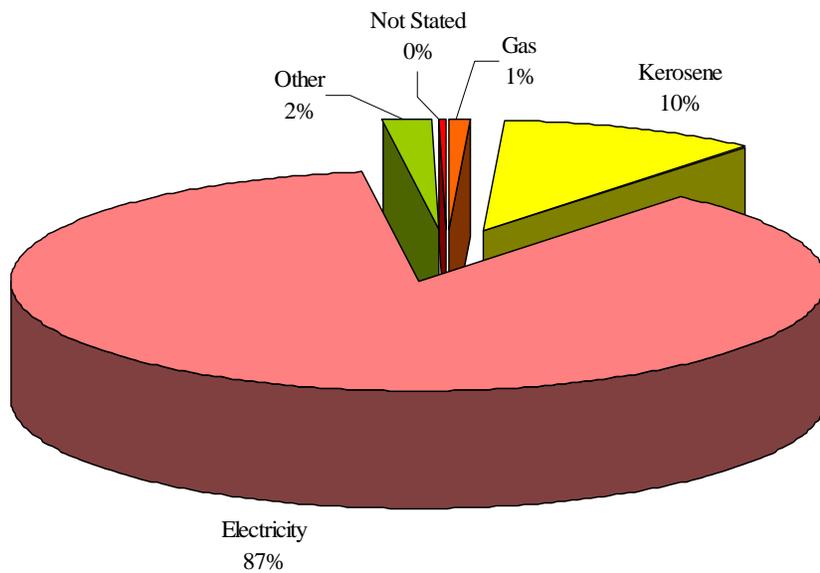
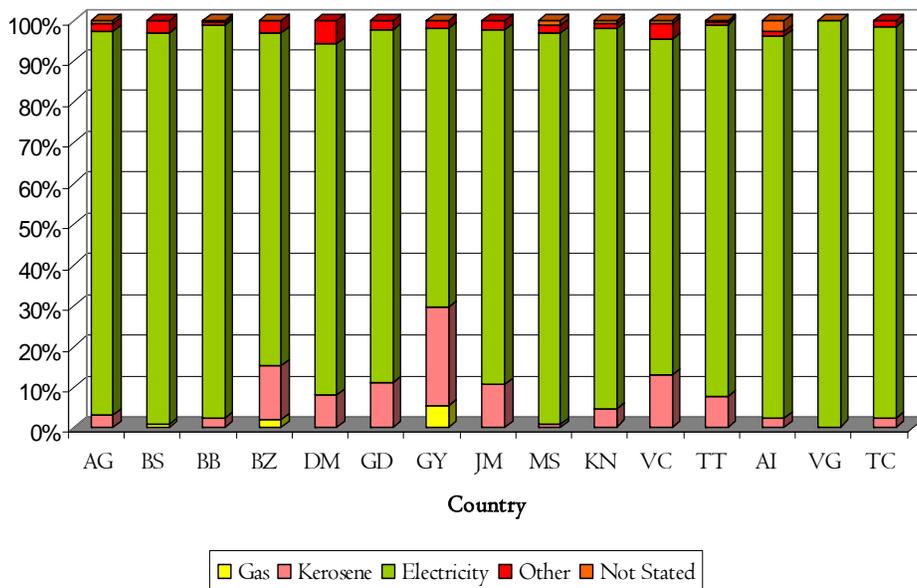
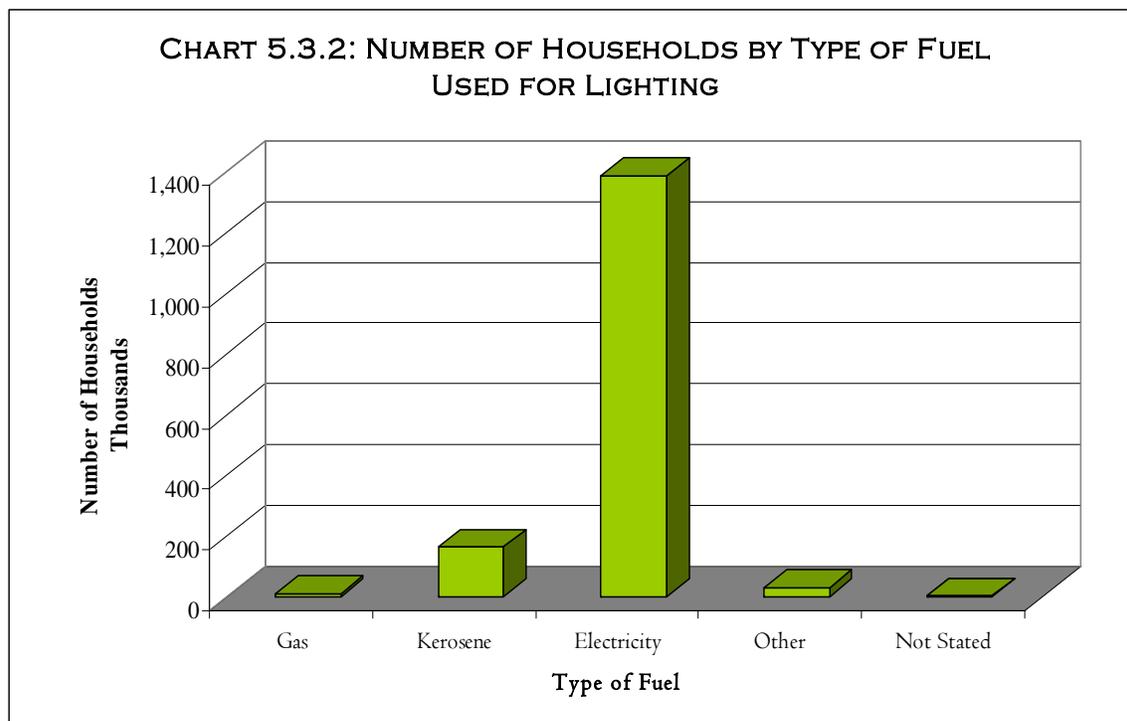


CHART 5.3.1(B): PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY TYPE OF FUEL USED FOR LIGHTING AND MEMBER STATE/ASSOCIATE MEMBER





EM4: MINERAL PRODUCTION BY TYPE**H****Concepts and Definitions**

A *mineral* is defined as any of a class of substances occurring in nature, usually comprising inorganic substances, as quartz or feldspar, of definite chemical composition and usually of definite crystalline structure. They, however, sometimes also include rocks formed by these substances, as well as certain natural products of organic origin, such as asphalt or coal.

Types of Minerals

Gold is a soft, yellow, corrosion-resistant element. It is the most malleable and ductile metal, occurring in veins and alluvial deposits and recovered by mining or by panning or sluicing.

Silver is a lustrous, white, ductile, malleable, metallic element, occurring both uncombined and in ores, such as argentite.

Aluminium is a silvery-white, ductile, metallic element and is the most abundant in the earth's crust. It is found in combination, chiefly in bauxite.

Bauxite is the principal ore of aluminium, composed mainly of hydrous aluminium oxides and aluminium hydroxides.

Sand/Gravel is small loose grains of worn or disintegrated rock or an unconsolidated mixture of rock fragments and pebbles.

Limestone is a common sedimentary rock consisting mostly of calcium carbonate, CaCO_3 . It is used as a building stone and in the manufacture of lime, carbon dioxide, and cement.

Salt is a crystalline compound, sodium chloride, NaCl , which occurs as a mineral.

Clay is a fine-grained, firm, earthy material that is plastic when wet and hardens when heated. It consists primarily of hydrated silicates of aluminium and is widely used in making bricks, tiles, and pottery.

Crushed Stone is a concretioned earthy or mineral matter (rock) that is quarried and worked into a specific size and shape for a particular purpose.

A *diamond* is an extremely hard, highly refractive crystalline form of carbon that is usually colourless and is used as a gemstone and in abrasives, cutting tools, and other applications.

Gypsum, hydrated calcium sulphate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$), is a very common mineral occurring in crystals and in masses. It is soft enough to be scratched by the fingernail and is used to make plaster of Paris, as an ornamental material and as a fertilizer.

Anhydrite is a colourless, white, grey, blue, or lilac mineral of anhydrous calcium sulphate (CaSO_4), occurring as layers in gypsum deposits.

Marble is a metamorphic rock formed by alteration of limestone or dolomite, often irregularly coloured by impurities, and used especially in architecture and sculpture.

Silica Sand is the dioxide form of silicon, SiO_2 , occurring especially as quartz sand, flint, and agate. It is usually used in the form of its prepared white powder chiefly in the manufacture of glass, water glass, ceramics, and abrasives.

Stone is the hard, mineral substance of which rock consists.

Clay/Fill is a fine-grained, firm earthy material that is plastic when wet and hardens when heated. It consists primarily of hydrated silicates of aluminium and is widely used for making bricks, tiles, and pottery.

Lime sand & Silt are sedimentary materials consisting of very fine particles intermediate in size between sand and clay.

Dolomite, essentially $\text{CaMg}(\text{CO}_3)_2$, is a white or light-coloured mineral that is used in fertilizers, as a furnace refractory, and as a construction and ceramic material.

Limestone (Marble Grade) is a common sedimentary rock that consists mostly of calcium carbonate, CaCO_3 . It is used as a building stone and in the manufacture of lime, carbon dioxide, and cement.

Crude Oil is unrefined petroleum, which is a thick, flammable, yellow-to-black mixture of gaseous, liquid, and solid hydrocarbons that occurs naturally beneath the earth's surface.

Natural gas comprises gases, occurring in underground deposits, whether liquefied or gaseous, consisting mainly of methane.

Other refers to some other type of mineral not so far mentioned.

Method of Computation

Mineral production by type is classified from data obtained from Member States/Associate Members according to the categories: Gold, Silver, Aluminium, Bauxite, Sand/Gravel, Limestone, Salt, Clay, Crushed Stone, Diamond, Gypsum & Anhydrite, Marble, Silica Sand, Stone, Clay/Fill, Lime sand & Silt, Pridge sand, Dolomite, Limestone (Marble Grade), Crude Oil and Natural Gas and Other as defined in the forgoing section.

Indicator Relevance

Unsustainable exploitation of minerals will cause depletion in the long term, which can ultimately have a great impact on the economy of a country. The activities associated with mineral production, such as explosions, drilling and smelting, are a major source of air, water and soil pollution caused by the discharges of mineral wastes or mine tailings. For example, aluminium and iron production accounts for over 5 per cent of anthropogenic greenhouse gas (GHG) emissions worldwide. Alumina production is also associated with emission of dust and corrosive materials and creation of large amounts of alkaline mud ("red mud"). Dust and caustic soda contamination are also significant environmental concerns associated with the refining process. The biggest problem of smelting operations (processing alumina into aluminium) is fluoride emissions. In addition, these activities can also cause loss of habitats of wildlife. (*Trends in Consumption and Production: Selected Minerals "Discussion Paper of the United Nations Department of Economic and Social Affairs."*)

Data Assessment

This indicator, mineral production by type, is conceptually harmonized since the internationally recommended definition for a mineral was followed. Eight Member States provided data for this indicator. Those Member States were The Bahamas, Belize, Dominica, Grenada, Guyana, Jamaica, Suriname and Trinidad and Tobago.

Data Sources

Please refer to **Appendix 1.5.4** for the sources of the data on mineral production by type in Member States/Associate Members.

Evaluation

It can be seen from the data provided in **Table 5.4** below that mineral production is concentrated in Guyana, Jamaica, Belize and Suriname. Guyana reported the largest quantities of *gold* produced in the Region which ranged from 1.2 million tonnes in 1990 to 14.5 million tonnes in 1997 and was the only country to report on the production of *silver*. Guyana also reported production of *clay*, *crushed stone* and *diamonds*. Suriname produced an average of 4,064 x 1,000Mt of *bauxite* for the period 1990 to 2004, while Jamaica reportedly produced an average of 12.3Mt of *bauxite* for the same period. Suriname also reported average production of 1,977 x 1,000Mt of Aluminium for the years 2000 to 2004. Other production of minerals for Jamaica includes *gypsum and anhydrite*, *marble*, *silica sand* and *limestone*. Four Member States reported production of *sand* and *gravel* with the highest being reported by Jamaica averaging over 1.9 million tonnes from 1990 to 2004. The Bahamas was the only Member States which reported the production of *salt* which fluctuated since 1990 along with the production of *aragonite*. Mineral production in Belize included increasing production of *clays*, *sand* and *gravel*, *stone* and *bridgesand* and fluctuations in the production of *limestone*, *dolomite* and *limestone marble*. In 2004, crude oil production stood at 44,982 thousand barrels a 3 per cent increase from 2000, while natural gas production averaged 2,938 million standard cubic feet per day (mmscfd) representing an increase of 96.1 per cent from 2000.

Table 5.4- Mineral Production by Type: 1990 - 2004

Country	Year	Salt	Alagomite
BS		tonnes	tonnes
	1990	754,499	...
	1995	1,579,323	...
	1998	1,226,981	13,611
	1999	879,163	6,587
	2000	1,021,921	17,596
	2001	1,267,496	5,311
	2002	1,074,355	73
	2003	1,245,447	8,933

Country	Year	Sand and Gravel	Limestone	Stone	Clay/ Fill	Limesand & Silt	Pridgesand	Dolomite	Limestone Marble Grade
BZ		yds ³	yds^{3}	yds^{3}	yds^{3}	yds^{3}	yds^{3}	tonnes	ft ²
	1995	66,857	182,462	291	...	...	...	...	...
	1998	254,266	189,258	894	122,312	113,656	...	3,198	...
	1999	100,821	213,154	2,613	74,645	282,512	25,489	5,740	...
	2000	190,160	350,114	6,877	339,015	104,273	15,612	5,272	...
	2001	215,477	549,716	...	303,451	334,888	30,185	4,525	38,000
	2002	142,451	170,716	24,027	265,181	124,092	50,000	5,500	45,000
	2003	369,362	423,464	18,116	224,948	106,962	40,064	6,319	25,000
	2004	211,922	274,790	21,077	311,449	327,031	36,312	3,288	...

Country	Year	Sand and Gravel
DM		tonnes
	1995	*101,479
	1998	201,571
	1999	444,634
	2000	608,750
	2001	672,993
	2002	597,529
	2003	598,643
2004	*399,143	

Country	Year	Sand and Gravel
GD		yds ³
	1998	17,862
	1999	186
	2000	13,237
	2001	14,101
	2002	39,393
2003	116	

Table 5.4 Cont'd. Mineral Production by Type: 1990 - 2004

Country	Year	Gold	Silver	Aluminium	Clay	Crushed Stone	Diamonds
GY		kg	tonnes	tonnes	tons	tons	x10 ³ metric carats
	1990	1,204	0.1	1,423,058	2,000	49,000	15.3
	1991	1,844	0.1	1,345,727	2,000	55,000	29.3
	1992	2,475	0.1	895,196	6,000	73,000	46.0
	1993	9,635	0.5	2,093,899	406	110,000	50.9
	1994	11,678	0.6	1,991,132	...	150,000	36.8
	1995	9,005	0.5	2,028,080	...	...	52.4
	1996	12,007	0.6	2,475,459	...	...	46.7
	1997	14,571	0.7	2,470,895	360	90,000	36.5
	1998	14,146	0.7	2,267,368	...	214,000	35.3
	1999	12,905	0.7	2,359,272	...	...	52.6
2000	13,527	0.7	2,689,451	...	...	83.9	

Country	Year	Gold	Bauxite	Sand and Gravel	Limestone	Gypsum and Anhydrite	Marble	Silica Sand
JM		kg	tonnes	tonnes	tonnes	'000 tonnes	'000 tonnes	'000 tonnes
	1990	...	11.0	0.9	5.5	82.2	4.0	16.6
	1995	...	11.0	1.8	7.3	208.0	2.8	16.3
	1998	...	13.0	1.8	7.1	154.5	0.8	6.1
	1999	...	12.0	2.1	7.8	236.0	0.4	9.4
	2000	...	11.1	2.1	8.1	330.0	0.1	6.7
	2001	227	12.4	2.2	8.9	320.3	0.1	8.2
	2002	...	13.1	2.2	9.2	164.9	0.2	9.4
	2003	...	13.4	2.3	9.9	249.0	0.2	12.8
	2004	...	13.3	2.4	8.4	283.0	0.1	11.2

Country	Year	Aluminium	Bauxite
SR			tonne*
	2000	...	3,659.0
	2001	...	4,334.0
	2002	1,902	3,999.0
	2003	2,004	4,111.0
2004	2,025	4,217.0	

Country	Year	Crude Oil	Natural gas
TT		('000 barrels)	(million cubic feet/day)
	2000	43,680	1,498
	2001	41,469	1,596
	2002	47,824	1,826
	2003	49,117	2,594
2004	44,982	2,938	

EM5: MINERAL RESERVES BY TYPE**H****Concepts and Definitions**

A *mineral* is defined as any of a class of substances occurring in nature, usually comprising inorganic substances, as quartz or feldspar, of definite chemical composition and usually of definite crystal structure. They, however, sometimes also include rocks formed by these substances, as well as certain natural products of organic origin, such as asphalt or coal.

A '*Mineral Reserve*' is the economically mineable part of a measured or indicated mineral resource. It is inclusive of diluting materials and allows for losses that may occur when the material is mined.

A '*Mineral Resource*' is a concentration or occurrence of material of intrinsic economic interest in or on the Earth's crust (a deposit) in such form and quantity that there are reasonable prospects for eventual economic extraction.

Minerals

Gold is a soft, yellow, corrosion-resistant element. It is the most malleable and ductile metal, occurring in veins and alluvial deposits and recovered by mining or by panning or sluicing. A good thermal and electrical conductor, gold is generally alloyed to increase its strength, and it is used as an international monetary standard, in jewellery, for decoration, and as a plated coating on a wide variety of electrical and mechanical components.

Silver is a lustrous, white, ductile, malleable, metallic element, occurring both uncombined and in ores, such as argentite. It has the highest thermal and electrical conductivity of the metals.

Iron is a silvery-white, lustrous, malleable, ductile, magnetic, metallic element occurring abundantly in combined forms, notably in hematite, limonite, magnetite, and taconite

Bauxite is the principal ore of aluminium, composed mainly of hydrous aluminium oxides and aluminium hydroxides.

Nickel is a silvery, hard, ductile and ferromagnetic metallic element used in alloys, in corrosion-resistant surfaces, batteries and for electroplating.

Sand/Gravel is small loose grains of worn or disintegrated rock or an unconsolidated mixture of rock fragments and pebbles.

Limestone is a common sedimentary rock that consists mostly of calcium carbonate, CaCO₃. It is used as a building stone and in the manufacture of lime, carbon dioxide, and cement.

Salt is a crystalline compound, sodium chloride, NaCl, which occurs as a mineral.

Crude Oil is unrefined petroleum, which is a thick, flammable, yellow-to-black mixture of gaseous, liquid, and solid hydrocarbons that occurs naturally beneath the earth's surface.

Gypsum, hydrated calcium sulphate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$), is a very common mineral occurring in crystals and in masses. It is soft enough to be scratched by the fingernail and is used to make plaster of Paris, as an ornamental material and as a fertilizer.

Anhydrite is a colourless, white, grey, blue, or lilac mineral of anhydrous calcium sulphate (CaSO_4), occurring as layers in gypsum deposits.

Marble is a metamorphic rock formed by alteration of limestone or dolomite, often irregularly coloured by impurities, and used especially in architecture and sculpture.

Silica Sand is the dioxide form of silicon, SiO_2 , occurring especially as quartz sand, flint, and agate. It is usually used in the form of its prepared white powder chiefly in the manufacture of glass, water glass, ceramics, and abrasives.

Not Stated refers to minerals that have not been so far mentioned and that were not specified in the questionnaires.

Method of Computation

Data for this indicator was obtained from Member States/Associate Members according to the categories: Gold, Silver, Iron, Bauxite, Nickel, Sand & Gravel, Limestone, Salt, Crude Oil, Gypsum & Anhydrite, Marble, Silica Sand and Not Stated.

Indicator Relevance

The purpose of the indicator is to measure the availability of mineral resources. Mineral reserves estimates, particularly in terms of years remaining at current rates of extraction, are crucial for the assessment of sustainable development. The factors for estimating the availability of non-renewable resources are exhaustibility, uncertainty and economic supply as a function of price and technology. The conservation of energy and the increased use of recycling materials can result in reducing mineral exploitation.

Data Assessment

The internationally recommended definition of a mineral reserve was followed and so, this indicator is regionally and internationally conceptually harmonized.

Data Sources

Three Member States provided data for this indicator. Those three countries are Grenada, Guyana and Jamaica. None of the Associate Members provided data. The data for this indicator is, therefore, sparse and with little detail. Please refer to **Appendix 1.5.5** for the sources of the data on mineral reserves by type in Member States/Associate Members.

Evaluation

Data on mineral reserves for three Member States is presented in **Table 5.5** below. In Guyana mineral reserves of *bauxite* was 1,200 x 106 million tonnes in 1996 whereas Grenada reported its reserves of *sand and gravel* experiencing major fluctuations from 17,862 cubic yards in 1998 to 186 cubic yards in 1999 then increasing to 13,237 cubic yards in 2000 with further increases in 2001 (14,101 cubic yards) and 2002 (39,393 cubic yards) with a high decline in 2003 to 116 cubic yards. The table below also shows data for Jamaica whose reserves of *gold* were 986 in 2002. The data for Jamaica also shows reserves of *bauxite* at 2,500 tonnes in 1990 and 2002, *limestone*, *sand and gravel*, *gypsum* and *anhydrite*, *marble* and *silica sand*.

Table 5.5 - Mineral Reserves by Type: 1998 - 2003

Country	Year	Gold	Bauxite	Sand & Gravel	Limestone	Gypsum & Anhydrite	Marble	Silica Sand
GD				yds ³				
	1998	...	...	17,862	...	...	...	...
	1999	...	...	186	...	...	...	...
	2000	...	...	13,237	...	...	...	...
	2001	...	...	14,101	...	...	...	...
	2002	...	...	39,393	...	...	...	...
	2003	...	...	116	...	...	...	...
GY	1996	...	tonnes 1,200,000,000	...	...	...	...	...
JM		kg	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes
	1990	...	2,500	...	...	...	...	...
	2002	986	2,500	2.4	3,100,450	85	355	2.1

Appendix 1.5

1.5.1 (a): Sources of Data for Table 5.1 - Energy Consumption by Type and Year: 1990, 1995, 1998 - 2004

Country	Data Source
THE BAHAMAS	Bahamas Electricity Company
BELIZE	Land Information Centre/ Ministry of Natural Resources
DOMINICA	Central Statistical Office and Dominica Electricity Services
GRENADA	National Statistical Office
JAMAICA	Jamaica Public Service Company, Ministry of Commerce, Science & Technology
SAINT LUCIA	Saint Lucia Electricity Services Limited
ST. VINCENT AND THE GRENADINES	St. Vincent Electricity Services
BERMUDA	Department of Statistics: Facts and Figures

1.5.1 (b): Notes for Table 5.1 - Energy Consumption by Type and Year: 1990, 1995, 1998 - 2004

Country	Notes
THE BAHAMAS	The increase in kWh sold and the corresponding fuel consumption is a direct reflection of Bahamas Electricity Company's use of higher efficiency machinery, which uses lower grade and less fuel. n/a refer to not applicable or not in use at any measurable scale.
DOMINICA	Liquids are Kerosene, Diesel and Gasoline. Gases are Butane and Propane.
JAMAICA	a/: Import of liquid fuels p: provisional data boe: barrel oil equivalent

1.5.2 (a): Sources of Data for Table 5.2 - Number of Households by Type of Fuel Used for Cooking: 2000 Round of Census

Country	Data Source
ANTIGUA AND BARBUDA	Basic Table Volume
THE BAHAMAS	Population and Housing Census, 2000 Round
BARBADOS	Basic Table Volume
BELIZE	Population and Housing Census, 2000 Round
DOMINICA	Population and Housing Census, Central Statistics Office
GRENADA	Population and Housing Census 2001
GUYANA	Basic Table Volume
JAMAICA	Population Census 2001
MONTserrat	Basic Table Volume
ST. KITTS AND NEVIS	Basic Table Volume
SAINT LUCIA	Population and Housing Census, 2000 Round
ST VINCENT AND THE GRENADINES	Basic Table Volume
SURINAME	Population and Housing Census, 2000 Round
TRINIDAD AND TOBAGO	Central Statistical Office/2000 Population and Housing Census
ANGUILLA	Basic Table Volume
BRITISH VIRGIN ISLANDS	Basic Table Volume
THE TURKS AND CAICOS ISLANDS	TCI 2001 Population & Housing Census, Statistical Office

1.5.2 (b): Notes for Table 5.3 - Number of Households by Type of Fuel Used for Cooking: 2000 Round of Census

Country	Notes
THE BAHAMAS	Other includes not stated
BARBADOS	Charcoal = wood/charcoal. Other includes natural gas, solar and other.
DOMINICA	Other includes not stated. Charcoal = coal/wood
GRENADA	Other includes not stated
GUYANA	Charcoal = coal
JAMAICA	Other includes not stated
SAINT LUCIA	Other includes not stated. Charcoal = coal/wood
ST VINCENT AND THE GRENADINES	Other includes not stated
TRINIDAD AND TOBAGO	Charcoal = coal/wood
ANGUILLA	Charcoal = charcoal/wood
THE TURKS AND CAICOS ISLANDS	Charcoal = coal/wood

1.5.3 (a): Sources of Data for Table 5.3 - Number of Households by Type of Fuel Used For Lighting: 2000 Round of Census

Country	Data Source
ANTIGUA AND BARBUDA	Basic Table Volume
THE BAHAMAS	Population and Housing Census, 2000 Round
BARBADOS	Basic Table Volume
BELIZE	Basic Table Volume
DOMINICA	Population and Housing Census, Central Statistical Offices
GRENADA	Population and Housing Census 2001
GUYANA	Basic Table Volume
JAMAICA	Population and Housing Census 2001
MONTSERRAT	Basic Table Volume
ST. KITTS AND NEVIS	Basic Table Volume
ST VINCENT AND THE GRENADINES	Basic Table Volume
TRINIDAD AND TOBAGO	Central Statistical Office/2000 Population and Housing Census
ANGUILLA	Basic Table Volume
BRITISH VIRGIN ISLANDS	Basic Table Volume
THE TURKS AND CAICOS ISLANDS	TCI 2001 Population and Housing Census, Statistical Office

1.5.3 (b): Notes for Table 5.3 - Number of Households by Type of Fuel Used for Lighting: 2000 Round of Census

Country	Notes
ANTIGUA AND BARBUDA	Not stated includes none.
THE BAHAMAS	Other includes not stated
BARBADOS	Other includes batteries and other.
DOMINICA	1981 data for kerosene lighting was mainly due to Hurricane David's devastating effects on electrical power.
GUYANA	Other includes generator/inverter and other.
GRENADA	Other includes not stated
JAMAICA	Other includes not stated
MONTserrat	Not stated = none.
ST VINCENT AND THE GRENADINES	Other includes not stated. Not stated = none.
ANGUILLA	Other = other + none
BRITISH VIRGIN ISLANDS	Not stated = none.

1.5.4 (a): Sources of Data for Table 5.4 - Mineral Production by Type: 1990 - 2004

Country	Data Source
THE BAHAMAS	Department of Statistics
BELIZE	Land Information Centre/ Ministry of Natural Resources
DOMINICA	Central Statistical Office
GRENADA	Central Statistical Office
GUYANA	Guyana Geology and Mines Commission
JAMAICA	Mines & Geology Division, Jamaica Bauxite Institute
TRINIDAD AND TOBAGO	Ministry of Planning and Development, First Compendium of Environmental Statistics of Trinidad and Tobago
SURINAME	General Bureau of Statistics

1.5.4 (b): Notes for Table 5.4 - Mineral Production by Type: 1990 – 2004

Country	Notes
THE BAHAMAS	Other refers to Aragonite.
DOMINICA	*: only export data available. There are no reserves or production of gold, silver, iron, aluminium, nickel, limestone, salt and crude oil.

1.5.5 (a): Sources of Data for Table 5.5 - Mineral Reserves by Type: 1998 - 2003

Country	Data Source
GRENADA	National Statistical Office.
GUYANA	Guyana Geology and Mines Commission
JAMAICA	Mines & Geology Division, Jamaica Bauxite Institute

1.5.5 (b): Notes for Table 5.5 - Mineral Reserves by Type: 1998 - 2003

Country	Notes
JAMAICA	It is difficult to arrive at a value for reserves of sand and gravel as there is replenishment in river beds and plains after heavy rainfall. There are no reserves or production of gold, silver, iron, aluminium, nickel, limestone, salt and crude oil.

REFERENCES

1. The United Nations Statistics Division, Energy Statistics: Definitions, Units of Measure and Conversion Factors
2. A joint publication by the World Resources Institute, the United Nation's Environment Programme, the United Nations Development Programme, and The World Bank, World Resources 1998-99: Environmental change and human health

LA1: LAND USE**H****Concepts and Definitions**

Land use refers to the functional division of land for different human purposes or economic activities. (Please refer to the OECD's Glossary of Statistical Terms website at <http://stats.oecd.org/glossary/>)

Land Types

Agricultural land includes land under scattered farm buildings, yards and their annexes and permanently uncultivated land, such as uncultivated patches, banks, footpaths, ditches, headlands and shoulders.

- *Arable land* refers to all land generally under rotation whether for temporary crops or meadows or left fallow.

- *Land under permanent crops* signifies land used for crops occupying it for a long period of time and which do not have to be planted for several years after each harvest. Land under trees and shrubs producing flowers, such as roses and jasmine, is so classified, as are nurseries (except those for forest trees); permanent meadows and pastures are excluded.

- *Fallow and other agricultural land* is arable land not under rotation that is set at rest for a period of time ranging from one to five years before it is cultivated again. It includes land usually under permanent crops, meadows or pastures, which is not being used for that purpose for a period of at least one year. Arable land which is normally used for the cultivation of temporary crops but which is temporarily used for grazing is included. Also included are scattered farm buildings, that is, isolated buildings not belonging to closed villages or similar rural localities.

- *Land under permanent meadows and pastures* means land used permanently (that is, for five years and more) for herbaceous forage crops. Permanent meadows and pastures on which trees and shrubs are grown are included in this category only if the growing of forage crop is the most important use of the area.

Forest and other wooded land includes forest nurseries and seed orchards that constitute an integral part of the forest; forest roads, cleared tracts, firebreaks and other small open areas within the forest; forest in national parks, nature reserves and other protected areas such as those of special environmental, scientific, historical, cultural or spiritual interest; and windbreaks and shelterbelts of trees with an area of more than half a hectare and a width of more than twenty metres. Rubberwood plantations and cork oak stands are included but land predominantly used for agricultural practices are excluded.

- *Land under forest* refers to land under natural or planted stands of trees, whether productive or not. This category includes land from which forests have been cleared but that will be reforested in the foreseeable future, but it excludes woodland or forest used only for recreation purposes.

- *Other wooded land* refers to land either with a tree crown cover of five to ten per cent of trees able to reach a height of five metres at maturity; or a crown cover of more than ten per cent of trees not able to reach a height of five metres at maturity and shrub or bush cover.

Built-up and related land refers to land under houses, roads, mines and quarries, and other facilities, including their auxiliary spaces, deliberately installed for the pursuit of human activities. Land under closed villages or similar rural localities and open land closely related to these activities, such as waste tips, derelict land in built-up areas, junk yards, city parks and gardens, etc, are included in this category. Land occupied by scattered farm buildings, yards and their annexes are excluded.

Wet open land refers to non-wooded sites either partially, temporarily or permanently water-logged, the water of which may be fresh, brackish or saline, on blanket or raised peatlands. The water may be either stagnant or running, and is usually shallow, especially if it is saline.

Dry open land with special vegetation cover refers to non-wooded land that is covered by low (less than two metres high) vegetation.

Open land without, or with insignificant, vegetation cover refers to non-built-up land whose surface is either not covered at all by vegetation or scarcely covered by some vegetation.

Waters relate to the part of the national territory to be reported which is covered by surface waters. The national territory to be reported is defined as the surface enclosed by all inland borders and, if applicable, the normal base-line on the seaward side.

Total area is the total area of the country, including area under inland and tidal water bodies but excluding uninhabited islands.

Total land area is the total area excluding area under inland water bodies (major rivers, lakes, etc).

Method of Computation

Data on land use was compiled from questionnaires distributed to Member States/Associate Members through UNSD/UNEP/CARICOM collaboration according to the categories mentioned above.

Indicator Relevance

Land use is one of the most direct ways to examine changes in environmental quality. Changes measured over various time periods can indicate the extent to which man has modified the basic land resource of a country for agriculture, silviculture, industry, commercial establishments, human settlements, transport, recreation, waste disposal and other uses. The data for this indicator are intended to provide a general overview of the trends in land use that have occurred over the past years and to provide more specific information on present uses of land.

Information on land use change is also critical for integrated and sustainable land use planning. Such information is useful in identifying opportunities to protect land uses or to promote future allocation aimed at providing the greatest sustainable benefits for people.

Changes in arable and permanent crop land and wooded areas give important information about a country's endowment in agricultural and forest resources, both from an economic and an environmental perspective. Environmentally, unsustainable land use is an important factor in erosion and desertification. It may also pose a threat to ecosystems and lead to natural habitat loss and landscape changes. Landscape changes which lead, for example, to inappropriate farming and grazing practices or to environmentally insensitive construction or mining activities are significant from a sustainability viewpoint. This indicator acts as a measure for the more specific environmental and natural resource changes significant to sustainable development.

In addition, population growth is driving a rapid increase in the demand for food and fibre. At the same time, rising population density in rural areas diminishes the farm size. Small farmers are forced to extend cultivation to new areas, which are fragile and not suitable for cultivation. Crop intensification, which has contributed significantly to agricultural growth in recent years, can ease the pressure on cultivating new lands but farm practices adopted for raising yields (such as when expanding into new areas) can also, in some situations, result in damaging the environment. Changes in land use over time or between various components may show increased or decreased pressure on agricultural land.

Data Assessment

It is assumed that the concept of land use is in accordance with the international definition and is harmonized across the region.

Only seven (7) of the eighteen (18) Member States and Associate Members in the Community provided data for this indicator. Those seven (7), countries were Belize, Dominica, Guyana, Jamaica, St. Vincent and the Grenadines, Suriname and Trinidad and Tobago. The data provided by these countries for this indicator were sparse and contained numerous gaps.

Data Sources

Please refer to **Appendix 2.6.1 (a)** for the sources of the data on land use of Member States and Associate Members.

Evaluation

Seven Member States reported data on *Land Use* as presented in **Table 6.1** below. Belize reported a total area of 22,966 squared kilometres in 1990¹. *Agriculture land* represented 2,168 squared kilometres or 9 per cent of total area, *forest and other wooded land* was 16,437 or 72 per cent and other land (*built-up land, wet open land, dry open land with special vegetation cover and open land without, or with insignificant, vegetation cover*) totalling 2,778 or 12 per cent of total area. *Forest and other wooded land* covered 168,789 squared kilometres of the total area in Guyana in 2000.

Dominica reported a *total land area* of 750 squared kilometres throughout the period. Of this, land used for agricultural purposes declined from 190 squared kilometres in 1970 and 1980 to 180 squared kilometres in 1990 then increased to 210 squared kilometres in 2000. *Agriculture land* consisted *arable land*, which declined from 70 squared kilometres in 1970 and 1980 to 50 squared kilometres in 1990 and 2000, *land under permanent crops* which saw increases from 100 squared kilometres in 1970 and 1980 to 110 squared kilometres in 1990 then to 140 in 2000. In Dominica, *forest and other wooded land* remained fixed at 500 squared kilometres throughout the period and data was reported as consisting 460 squared kilometres.

Jamaica reported total area of 10,990 squared kilometres including 10,830 squared kilometres *land area*. *Land under permanent crops* declined from 2,308 squared kilometres in 1978 to 1,776 squared kilometres in 1996 while *fallow and other agricultural land* increased from 1,125 squared kilometres in 1978 to 1,294 squared kilometres in 1996. *Land under permanent meadows and pastures* also reported an increase from 808 squared kilometres in 1978 to 956 squared kilometres in 1996. Jamaica's data on *forest and wooded land* revealed declines for all uses which included *land under forest* (moving from 2,874 in 1989 squared kilometres to 2,839 squared kilometres in 1998) and *other wooded land* (declining from 1337 squared kilometres in 1978 to 421 squared kilometres in 1989 finally to 420 in 1998). Data was also received for *wet open land* which was reported at 24 squared kilometres in 1989 and 23 squared kilometres in 1998, and *land with special vegetation cover* at 121 squared kilometres for both years.

Suriname's total area was 163,820 squared kilometres consisting 156,550 squared kilometres *land area* and 7,270 squared kilometres of *waters*. Total *agriculture land* remained fixed at 1,060 squared kilometres whereas its components, *arable land* and *land under permanent crops* declined from 1980 to 2000 with fluctuations experienced

¹ Data extracted from the 1989/92 land use study of Belize, with the exception of the value for forest and other wooded land which comes from a revised land use study in 1996/1998.

between years. *Forest and wooden land* fluctuated from 149,400 squared kilometres in 1980 to 148,900 squared kilometres in 1985 then to 150,940 squared kilometres in 1995.

Trinidad and Tobago's *total land area* was reported at 5,130 squared kilometres. *Agriculture land* increased from 1,100 squared kilometres in 1970 to 1,330 squared kilometres in 2000 with increases for *arable land* by 32 per cent from 570 squared kilometres in 1970 to 750 squared kilometres in 2000 and *land under permanent crops* by 9 per cent from 430 squared kilometres in 1970 to 470 squared kilometres in 2000. Total *forest and other wooden land* was reportedly 2,400 squared kilometres in 1970 and 2,300 squared kilometres in 1990 and 2,349 squared kilometres in 2002.

Total land area of St. Vincent and the Grenadines was reported at 390 squared kilometres. *Agricultural land* increased during the period from 110 squared kilometres in 1970 to 160 squared kilometres in 2000 while *forest and other wooden land* remained fixed at 140 squared kilometres.

Table 6.1 – Land Use : 1970, 1978, 1980, 1985, 1990, 1995 - 1996, 1999 - 2000, 2002

Unit = km²

Country	Year	Agricultural land				Total	Forest and other wooded land		
		Arable land	Land under permanent crops	Land under permanent meadows and pastures	Fallow and other agricultural land		Land under forest	Other wooded land	Total
BZ	1990	...	...	...	...	2,168	...	...	16,437
DM	1970	70	100	...	...	190	...	...	500
	1980	70	100	...	...	190	...	...	500
	1990	50	110	...	...	180	500	-	500
	2000	50	140	...	...	210	460	...	...
GY	2000	...	...	...	...	...	...	...	168,789
JM	1978	-	2,308	808	1,125	...	...	1,337	...
	1989	...	...	...	...	...	2,874	421	3,295
	1996	-	1,776	956	1,294	...	...	...	...
	1998	...	...	...	...	...	2,839	420	3,259
VC	1970	60	40	...	...	110	...	...	140
	1980	50	50	...	...	120	...	...	140
	1990	50	70	...	...	140	70	...	140
	2000	70	70	...	...	160	60	...	...
SR	1980	670	110	...	...	1,060	...	...	149,400
	1985	...	...	...	...	...	...	...	148,900
	1990	550	150	...	...	1,060	...	...	...
	1995	650	100	...	...	1,060	...	...	150,940
	1999	...	...	...	...	...	...	...	...
	2000	440	80	...	...	1,060	...	...	...
TT	1970	570	430	...	...	1,100	...	...	2,400
	1980	700	460	...	...	1,270	...	...	2,300
	1990	740	460	...	...	1,310	...	...	...
	2000	750	470	...	...	1,330	...	...	...
	2002	208	155	39	13	...	...	...	2,349

Table 6.1 Contd. Land Use : 1970, 1978, 1980, 1985, 1990, 1995 - 1996, 1999 - 2000, 2002

Unit = km²

Country	Year	Built-up and related land	Wet open land	Dry open land with special vegetation cover	Open land with/ without insignificant, vegetation cover	Total land area	Waters	Total area of the country
BZ	1990	84	2,686	...	8			22,966
DM	1970	...	...	...	...	750	-	750
	1980	...	...	...	...	750	-	750
	1990	...	...	...	...	750	-	750
	2000	...	...	...	...	750	-	750
GY	2000	...	...	...	...	...	...	...
JM	1978	...	...	...	...	10,830	160	10,990
	1989	...	24	121	...	10,830	160	10,990
	1996	...	...	...	...	10,830	160	10,990
	1998	...	23	121	...	10,830	160	10,990
VC	1970	...	...	...	...	390	-	390
	1980	...	...	...	...	390	-	390
	1990	...	...	...	...	390	-	390
	2000	...	...	...	...	390	-	390
SR	1980	...	...	...	...	156,550	7,270	163,820
	1985	...	...	...	...	156,550	7,270	163,820
	1990	...	...	...	...	156,550	7,270	163,820
	1995	...	...	...	...	156,550	7,270	163,820
	1999	...	...	...	...	156,550	7,270	163,820
	2000	...	...	...	...	156,550	7,270	163,820
TT	1970	...	...	...	...	5,130	-	5,130
	1980	...	...	...	...	5,130	-	5,130
	1990	...	...	...	...	5,130	-	5,130
	2000	...	...	...	...	5,130	-	5,130
	2002	...	...	...	...	...	...	...

Table 6.1 (b) Percentage distribution of Land Use : 1970, 1978, 1980, 1985, 1990, 1995 - 1996, 1999 - 2000, 2002

							(Percent)		
Country	Year	Agricultural land				Total	Forest and other wooded land		
		Arable land	Land under permanent crops	Land under permanent meadows and pastures	Fallow and other agricultural land		Land under forest	Other wooded land	Total
BZ	1990	...	...	...	...	9.4	...	...	71.6
DM	1970	9.3	13.3	...	...	25.3	...	...	66.7
	1980	9.3	13.3	...	...	25.3	...	...	66.7
	1990	6.7	14.7	...	...	24.0	66.7	-	66.7
	2000	6.7	18.7	...	...	28.0	61.3	...	...
GY	2000	...	...	...	...	...	...	...	...
JM	1978	-	21.0	7.4	10.2	...	...	12.2	...
	1989	...	...	...	...	...	26.1	3.8	30.0
	1996	-	16.2	8.7	11.8	...	...	...	...
	1998	...	...	...	...	...	25.8	3.8	29.6
VC	1970	15.4	10.3	...	...	28.2	...	...	35.9
	1980	12.8	12.8	...	...	30.8	...	...	35.9
	1990	12.8	17.9	...	...	35.9	17.9	...	35.9
	2000	17.9	17.9	...	...	41.0	15.4	...	...
SR	1980	0.4	0.1	...	...	0.6	...	...	91.2
	1985	...	...	...	...	...	...	...	90.9
	1990	0.3	0.1	...	...	0.6	...	...	...
	1995	0.4	0.1	...	...	0.6	...	...	92.1
	1999	...	...	...	...	...	...	...	...
	2000	0.3	0.0	...	...	0.6	...	...	...
TT	1970	11.1	8.4	...	...	21.4	...	...	46.8
	1980	13.6	9.0	...	...	24.8	...	...	44.8
	1990	14.4	9.0	...	...	25.5	...	...	...
	2000	14.6	9.2	...	...	25.9	...	...	...
	2002	...	...	...	...	...	...	...	...

Table 6.1 (b) Contd. Percentage distribution of Land Use : 1970, 1978, 1980, 1985, 1990, 1995 - 1996, 1999 - 2000, 2002

		(Percent)						
Country	Year	Built-up and related land	Wet open land	Dry open land with special vegetation cover	Open land with/ without insignificant, vegetation cover	Total land area	Waters	Total area of the country
BZ	1990	0.4	11.7	...	0.0			100.0
DM	1970	...	...	...	...	100.0	-	100.0
	1980	...	...	...	...	100.0	-	100.0
	1990	...	...	...	...	100.0	-	100.0
	2000	...	...	...	...	100.0	-	100.0
GY	2000	...	...	...	...	...	...	100.0
JM	1978	...	...	...	...	98.5	...	100.0
	1989	...	0.2	1.1	...	98.5	...	100.0
	1996	...	...	...	...	98.5	...	100.0
	1998	...	0.2	1.1	...	98.5	...	100.0
VC	1970	...	...	...	...	100.0	-	100.0
	1980	...	...	...	...	100.0	-	100.0
	1990	...	...	...	...	100.0	-	100.0
	2000	...	...	...	...	100.0	-	100.0
SR	1980	...	...	...	...	95.6	4.4	100.0
	1985	...	...	...	...	95.6	4.4	100.0
	1990	...	...	...	...	95.6	4.4	100.0
	1995	...	...	...	...	95.6	4.4	100.0
	1999	...	...	...	...	95.6	4.4	100.0
	2000	...	...	...	...	95.6	4.4	100.0
TT	1970	...	...	...	...	100.0	-	100.0
	1980	...	...	...	...	100.0	-	100.0
	1990	...	...	...	...	100.0	-	100.0
	2000	...	...	...	...	100.0	-	100.0
	2002	...	...	...	...	...	...	...

LA2: USE OF FERTILIZERS BY TYPE AND YEAR**H****Concepts and Definitions**

Fertilizers are compounds given to plants to promote growth. They are usually applied either via the soil, for uptake by plant roots, or by foliar feeding, for uptake through leaves. Fertilizers can be organic (composed of organic matter), or inorganic (made of simple, inorganic chemicals or minerals). They can be naturally occurring compounds such as peat or mineral deposits, or manufactured through natural processes (such as composting) or chemical processes (such as the Haber process).

Use of fertilizers by type and year refers to the yearly extent of fertilizer use in agriculture per unit of agricultural land area.

Types of Fertilizers

Nitrogenous fertilizers refer to the nitrogen content of commercial inorganic fertilizers.

Phosphate fertilizers refer to commercial phosphoric acid (P_2O_5) and cover the P_2O_5 of super-phosphates, ammonium phosphate and basic slag.

Potash fertilizers refer to the potassium oxide (K_2O) content of commercial potash, muriate, nitrate and sulphate of potash, manure salts, kainite and nitrate of soda potash.

NPK Mix: NPK is an acronym for nitrogen, phosphorus and potassium: the three nutrients that compose a complete fertilizer. They are also the three nutrients plants extract from soil in the greatest quantity and are available in synthetic, organic, and mineral forms.

Method of Computation

Data on fertilizers are compiled from industry and non-traditional sources. For developing countries, data generally refer to domestic disappearance based on imported products.

Indicator Relevance

The challenge for agriculture is to increase food production in a sustainable way. The use of mineral fertilizers in agriculture to increase cropping power simultaneously increases environmental hazards, such as water and soil pollution, and has toxic effects on other environmental components, interfering with the natural balance of soil micro flora. High levels of nitrate and nitrite in drinking water are a hazard to human health. The actual environmental effects, however, will depend on pollution abatement practices, soil and plant types, and meteorological conditions. Use of fertilizers by type and year makes it possible to assess the fertilizer load on the environment (the accumulation of fertilizers in

the soil, the resulting pollution of surface and groundwater, and the movement of fertilizers through tropic chains and other parts of the environment).

Data Assessment

Data on the use of fertilizers was submitted by five Member States and two Associate Members. All reporting Member States/Associate Members followed the internationally recommended definition for the use of fertilizers. This indicator is therefore conceptually harmonized among these countries. Data on the annual imports of fertilizers were used for all countries except Belize where production data was used, since no data on actual use are available.

Data Sources

Please refer to **Appendix 2.6.2 (a)** for the sources of the data on the use of fertilizers by type and year of Member States and Associate Member.

Evaluation

Data on the use of fertilizers can be seen in **Table 6.2** below for five Member States and one Associate Member. Jamaica followed by The Bahamas and Belize recorded the most fertilizer use with Nitrogenous fertilizers and Potash fertilizers being the most used for all reporting countries followed closely by NPK Mix. Comparing 1998 with the latest year available, all countries with the exception of Jamaica registered declines in the use of Fertilizers with moderate fluctuations in the intervening years. Among Member States, in 1998, the use of fertilizers ranged from a low of 3 tonnes in Anguilla to a high of 51,303 tonnes in Jamaica. Similarly in 2003, Anguilla had the lowest quantity of fertilizer use, 0.27 tonnes, and the highest use of fertilizers was found in Jamaica (52,639 tonnes).

Table 6.2 Use of fertilizers by type and year: 1990,1995,1998-2004

						(Tonne)
Country	Year	Nitrogenous fertilizers	Phosphate fertilizers	Potash fertilizers	NPK MIX	Total
BS	1995		838	...		838
	1998	6,446	45	25,317	0	31,808
	1999	4,363	280	24,129	0	28,772
	2000	5,461	608	7,905	0	13,974
	2001	1,390	364	20,044	0	21,798
	2002	7,213	409	25,042	0	32,664
	2003	3,582	87	21,342	0	25,011
BZ	1998	6,428	4,498	3,219	6,098	20,243
	1999	11,226	6,290	3,199	6,327	27,042
	2000	8,019	4,637	4,674	3,678	21,008
	2001	7,712	5,876	3,816	2,827	20,231
	2002	5,675	7,730	2,921	6,304	22,630
	2003	7,704	5,945	3,293	8,022	24,964
	2004	6,367	5,421	3,286	7,677	22,750
DM	1990	54	0	2	8,526	8,582
	1995	21	23	0	7,089	7,133
	1999	29	0	0	4,202	4,231
	2000	28	0	0	3,062	3,090
	2001	27	0	0	2,501	2,528
	2002	92	0	22	1,003	1,117
	2003	33	0	0	1,863	1,896
	2004	116	0	1	3,014	3,131
JM	1990	13,016	14	400	6,442	19,872
	1995	19,042	224	13,026	23,340	55,632
	1998	25,345	81	10,675	15,202	51,303
	1999	23,313	0	17,080	12,340	52,733
	2000	27,241	63	13,264	11,754	52,322
	2001	16,323	4	10,754	20,774	47,855
	2002	21,877	1	8,222	14,440	44,540
	2003	26,543	21	12,845	13,230	52,639
	2004	24,927	11	17,068	15,702	57,708
VC	1998	1	2	0	5,432	5,435
	1999	10	3	1	4,851	4,865
	2000	8	0	1	5,488	5,496
	2001	3	0	0	2,450	2,453
	2002	1	0	15	3,956	3,972
	2003	14	0	0	3,576	3,590
	2004	1	1	40	3,805	3,846
ASSOCIATE MEMBERS						
AI	1998	0.27	0.08	2.39	0.00	2.74
	1999	0.19	2.67	9.95	0.00	12.80
	2000	8.23	0.18	0.13	0.00	8.54
	2001	0.06	0.00	0.00	0.00	0.06
	2002	0.00	4.93	0.28	0.00	5.21
	2003	0.27	0.00	0.00	0.00	0.27
	2004	0.00	0.03	0.01	0.00	0.03

LA3: USE OF PESTICIDES BY TYPE AND YEAR**H****Concepts and Definitions**

A *pesticide* is any substance or mixture of substances intended for preventing, destroying or controlling any pest, including vectors of human or animal disease, unwanted species of plants or animals causing harm during or otherwise interfering with the production, processing, storage, transport or marketing of food, agricultural commodities, wood and wood products or animal feedstuffs, or substances which may be administered to animals for the control of insects, arachnids or other pests in or on their bodies. The term pesticide also includes substances intended for use as a plant growth regulator, defoliant, desiccant (agent for thinning fruit or preventing the premature fall of fruit), and substances applied to crops either before or after harvest to protect the commodity from deterioration during storage and transport.

Use of pesticides by type and year refers to the type and quantity of pesticides used in (or sold to) the agricultural sector.

Types of Pesticides

Insecticides are agents of chemical or biological origin that control insects. Control may result from killing the insect or otherwise preventing it from engaging in behaviours deemed destructive. Insecticides may be natural or manmade and include chlorinated hydrocarbons, organo-phosphates, carbonates-insecticides, pyrethroids, and botanical and biological products. Examples include Chlordane and DDT.

Herbicides are used to kill unwanted plants. Selective herbicides kill specific targets while leaving the desired crop relatively unharmed. Some selective herbicides act by interfering with the growth of the weed and are often based on plant hormones. Nonselective herbicides, on the other hand, kill all plant material with which they come into contact. Herbicides include phenoxy hormone products, triazines, amides, carbonates-herbicides, dinitroanilines, urea derivatives, sulfonyl urea, bipiridils and uracil.

Fungicides are chemical compounds used to prevent the spread of fungi or plants in gardens and crops, which can cause serious damage resulting in loss of yield and thus profit. Fungicides can either be contact or systemic. A contact fungicide kills fungi when sprayed on its surface; a systemic fungicide has to be absorbed by the plant.

Bactericides destroy, suppress or prevent the spread of bacteria. Examples are swimming pool chemicals containing chlorine, and products used to control black spot (bacterial blight) on garden plants or in orchards. Disinfectants for household and industrial use are excluded and are not considered pesticides

Seed treatments are chemical or biological substances or physical processes applied to seeds or seedlings. They help to protect the seeds and assure optimum emergence of the plant or crop. Application of a chemical to seeds is a very well-targeted method of reducing pest and disease attacks on the growing plant.

Plant growth regulators are substances or mixture of substances intended, through physiological action, to accelerate or retard the rate of growth or maturation, or otherwise alter the behaviour of plants or their produce. Additionally, plant regulators are characterized by their low rates of application (high application rates of the same compounds often are considered herbicidal).

Rodenticides are pesticides used specifically for controlling rodents, such as mice and rats, and include anti-coagulants.

Other refers to pesticides not so far mentioned.

Method of Computation

Data on pesticide use are usually derived from sales or “domestic disappearance” and expressed as active ingredients. Information on types of active ingredients in use, seasonal doses, rate of application, and variability on use for different crops and regions were used to derive the data for this indicator.

Indicator Relevance

This indicator serves as a measure of the use and amount of pesticides in agriculture. The major challenge for agriculture is to increase food production in a sustainable way. One important aspect of this challenge is the use of agricultural pesticides, which add persistent organic chemicals to ecosystems. Pesticides can be persistent, mobile, and toxic in soil, water, and air, and can impact humans and wildlife through the food chain. They tend to accumulate in the soil and in biota, and residues may reach surface and groundwater through leaching. Humans can be exposed to pesticides through food.

Persistent pesticides can cause adverse environmental effects. Exaggerated use may result from government subsidies and/or failure of pesticide users to internalise health-related costs. Better knowledge of used amounts helps activities aiming at a reduction of the consumption of pesticides to a level strictly adjusted to the actual situation of the farm land. In that way, the toxic emissions from pesticides can be kept at a minimum level.

Data Assessment

Data on the use of pesticide was submitted by five Member States and two Associate Members although data for Bermuda was reported in dollars as quantities were unavailable. All reporting Member States and Associate Members followed the internationally recommended definition for the use of pesticide. This indicator is therefore conceptually harmonized

among these countries. Data on imports of pesticides were used, since no data on actual use are available.

Data Sources

Please refer to **Appendix 2.6.3 (a)** for the sources of the data on the use of pesticides by type and year for Member States and Associate Members.

Evaluation

The data presented in **Table 6.3** below on the *use of pesticide* by type and year reveals that pesticide use has fluctuated greatly in most Member States and has declined in The Bahamas and Dominica. *Insecticides, herbicides and fungicides, bactericides and seed treatments* were the principal types of pesticides used in the CARICOM Region. Jamaica reported *use of pesticide* averaging 2,231 tonnes for the period 1998 to 2003 followed by Belize which averaged 1,237 tonnes for the period 1998 to 2004.

Table 6.3 Use of Pesticides by type and year: 1990, 1995, 1998 - 2004

								(tonnes)
Country	Year	Insecticides	Herbicides	Fungicides, bactericides and seed treatments	Plant growth regulators	Rodenticides	Others (including mineral oils)	TOTAL
BS	1998	628	62	281	26	8	66	1,071
	1999	552	34	365	22	20	46	1,040
	2000	806	40	285	29	11	14	1,185
	2001	574	33	261	33	16	3	921
	2002	674	96	102	40	16	10	938
	2003	617	72	61	34	15	4	803
BZ	1995	269	337	330	0	0	0	936
	1998	290	372	222	0	0	0	884
	1999	186	379	206	0	0	0	771
	2000	712	447	155	0	0	0	1,314
	2001	557	392	209	0	0	0	1,158
	2002	1,096	409	315	0	0	0	1,820
	2003	698	428	348	0	0	0	1,474
	2004	494	662	225	0	0	0	1,381
DM	1990	253	196	25	0	5	0	480
	1995	289	195	35	0	9	0	527
	1998	204	101	5	0	6	0	316
	1999	221	128	37	0	10	0	395
	2000	334	104	89	0	8	0	536
	2001	104	77	70	0	5	0	256
	2002	106	68	6	0	5	0	185
	2003	93	69	5	0	6	0	174
	2004	63	93	2	0	5	0	164
JM	1990*	656	489	275	0	26	9	1,454
	1995	426	657	1,439	45	22	1	2,590
	1998	602	649	390	38	54	2	1,735
	1999	682	928	868	11	56	7	2,551
	2000	699	755	729	30	138	9	2,360
	2001	683	864	302	126	25	35	2,035
	2002	620	810	356	225	69	8	2,088
	2003	626	934	856	121	73	7	2,618
VC	1998	300	116	241	0	4	5	666
	1999	284	287	384	0	3	1	959
	2000	324	126	290	1	4	1	746
	2001	155	85	126	0	6	0	373
	2002	207	135	269	1	4	0	616
	2003	235	91	122	5	8	1	463
	2004	378	184	150	0	5	14	731
SR (kg)	2000	378	...	...	...	...	...	...
	2001	262	...	...	...	...	...	...
	2003	503	...	...	...	...	...	...
	2004	483	...	...	...	...	...	...
ASSOCIATE MEMBERS								
AI	1998	52	0	1	0	2	45	100
	1999	31	1	0	0	2	41	74
	2000	35	0	0	0	2	61	98
	2001	52	1	1	2	2	74	132
	2002	82	2	0	1	1	81	167
	2003	154	2	1	0	1	51	208
	2004	57	8	6	0	1	55	127

Appendix 1.6 Conversion Table

Metric	to	Imperial
62 UK tons		63 tonnes
2205 pounds		1 tonne
2.25 pounds		1 kilogram

Appendix 2.6 Sources of Data on Land Use and Agriculture

2.6.1 (a): Source of Data for Table 6.1 – Land Use: 1970, 1978, 1980, 1985, 1990, 1995 - 1996, 1999 - 2000, 2002

Country	Data Source
Belize	1989/1992 Land Use Study of Belize
Dominica	Central Statistical Office
Guyana	Bureau of Statistics
Jamaica	Statistical Institute of Jamaica
St. Vincent and the Grenadines	Statistical Office
Suriname	General Bureau of Statistics
Trinidad and Tobago	Ministry of Agriculture

2.6.1 (b): Notes for Table 6.1 – Land Use: 1970, 1978, 1980, 1985, 1990, 1995 - 1996, 1999 - 2000, 2002

Country	Notes
Belize	<p>Data from the 1989/1992 land use study of Belize, with the exception of the value for forest and other wooded land which come from a revised land study in 1996/ 1998.</p> <p>*: Total land area and waters do not add to the total area of Belize, because it does not account for all water bodies found in mainland Belize and cloud cover.</p>
Dominica	<p>Data for 1995 is based on the agricultural study. 1970 and 1980 data for agricultural land are FAO Unofficial figures. 1990 and 200 data for agricultural land are FAO Estimates. 1970 and 1980 total forest and other wooded land data are FAO estimates. The 1990 total forest and other wooded land data is an unofficial FAO figure.</p>
St. Vincent and the Grenadines	<p>1970, 1980, 1990 and 2000 agricultural land data are FAO estimates. 1990 total forest and wooded land data is also an FAO estimate. 1980 total forest and other wooded land data is an unofficial FAO figure.</p>
Trinidad and Tobago	<p>The data provided only represents lands managed for agricultural use. These lands are state leased and are zones for agricultural production by the Town and Country Planning Division. The total land under agricultural production is greater than the figures provided and are outside the scope of the Land Administration Division's databases. The national soil maps may provide some information regarding total land capability but the monitoring of actual land use are not within the division's jurisdiction.</p> <p>*: Forest and wooded areas are classified together as part of food crops and agro forestry. Because of multi-cropping practices, no distinction can be made. The area of 368.32 squared kilometres for forest is part of the total agricultural lands.</p> <p>1970, 1980, 1990 and 2000 agricultural land data are FAO estimates. 1970, 1980 and 1990 total forest and other wooded land are unofficial FAO figures.</p>

2.6.2 (a): Sources of Data for Table 6.2 - Use of Fertilizers by Type and Year: 1990, 1995, 1998 - 2004

Country	Data Source
The Bahamas	Trade Section, Department of Statistics
Belize	Environmental Statistical Unit/Ministry of Natural Resources and Environment
Dominica	Central Statistical Office
Jamaica	Statistical Institute of Jamaica
St. Vincent and the Grenadines	Statistical Office
Anguilla	Customs Office

2.6.2 (b): Notes for Table 6.2 - Use of Fertilizers by Type and Year: 1990, 1995, 1998 - 2004

Country	Notes
Belize	Information refers to fertilizer production by fertilizer companies in Belize.
Dominica	Data refer to annual imports.
Jamaica	This data represents the total imports. Some fertilizers are also exported.
St. Vincent and the Grenadines	These figures represent imports of fertilizer.
Anguilla	This data is the imports of the mentioned fertilizers and not the usage. It is, therefore, assumed that all imports are consumed within the specific year.

2.6.3 (a): Sources of Data for Table 6.3 - Use of Pesticides by Type and Year: 1990, 1995, 1998 - 2004

Country	Data Source
The Bahamas	Trade Section, Department of Statistics
Belize	Central Statistical Office: Trade Data
Dominica	Central Statistical Office
Jamaica	Statistical Institute of Jamaica
St. Vincent and the Grenadines	Statistical Office
Suriname	General Bureau of Statistics
Anguilla	Customs Office

2.6.3 (b): Notes for Table 6.3 - Use of Pesticides by Type and Year: 1990, 1995, 1998 - 2004

Country	Notes
Belize	Information provided is based on imports.
Dominica	Data refer to annual imports.
Jamaica	*: Rodenticides include anti-sprouting products, plant growth regulators, and similar products in 1990.
St. Vincent and the Grenadines	The figures represent imports of pesticides.
Suriname	General Bureau of Statistics
Anguilla	This data is the imports of the abovementioned pesticides and not the usage. It is, therefore, assumed that all imports are consumed within the specific year.

MR1: TOTAL AND PROTECTED MARINE AREA**DK****Concepts and Definitions**

Marine Protected Area (MPA) is any area of intertidal or subtidal terrain together with its overlying water and associated flora, fauna, historical and cultural features, which have been reserved by law or *other effective means to protect part or all of the enclosed environment*. (Please refer to the IUCN Centre for Mediterranean Cooperation's website at http://www.uicnmed.org/web2007/documentos/Rapport_final_AMP_en.pdf [last accessed: July 11, 2009])

A *Marine area* is defined as the foreshore, seabed, coastal water, and air space above the water (i) of which the seaward boundary is the outer limits of the territorial sea; and (ii) of which the landward boundary is the line of mean high water springs, except that where that line crosses a river, the landward boundary at that point shall be whichever is the lesser of one kilometre upstream from the mouth of the river or the point upstream that is calculated by multiplying the width of the river mouth by 5. (Please refer to the Greater Wellington Regional Council's website at <http://www.gw.govt.nz/story1210.cfm>.)

Method of Computation

Data for this indicator, total and protected marine area, were obtained from Member States and Associate Members.

Indicator Relevance

Marine protected areas (MPAs) are used as management tools to protect, maintain, or restore natural and cultural resources in coastal and marine waters. New MPAs are designated worldwide every year, and it is becoming more and more difficult to make a current analysis of the coverage offered by MPAs. Nevertheless, inventories are necessary for effective planning, and regional MPA databases are becoming more common. MPAs have different shapes, sizes, and management characteristics, and have been established for different purposes.

In the CARICOM Region, a significant number of the MPAs, particularly in the insular states, have been established as fisheries management tools, with the recognition of their utility as tourism attractions. MPAs are often unique ecosystems that make them attractive to tourists, for scuba diving, sight seeing and other activities. Without proper management, however, tourists can quickly degrade the very resources that they have travelled to see. Although there are an increasing number of MPAs in the CARICOM Region, the amount of tourists visiting the Region is also growing; hence the carrying capacities of the existing MPAs may be soon exceeded by the numbers of tourists utilizing them.

Data Assessment

Data for this indicator were collected for six Member States and two Associate Members. The six Member States were The Bahamas, Belize, Dominica, Jamaica, Saint Lucia, and St. Vincent and the Grenadines. The Associate Members were Bermuda and The Turks and Caicos Islands.

Data were requested for five years: 1970, 1980, 1990, 2000 and 2004. Among Member States, only The Bahamas provided data for all the years requested - Jamaica and Saint Lucia provided data for 2000 alone whilst Belize and Dominica provided data for 2000 and 2004 and St. Vincent and the Grenadines provided data for 1990, 2000 and 2004. Like the Bahamas, both reporting Associate Members provided data for all the years requested. It should be noted that the protected area for The Turks and Caicos Islands was legally/formally established in 1992. As such, 1970, 1980 and 1990 data points are not applicable for protected marine area.

No definition was provided for this indicator from reporting Member States/Associate Members. It is therefore impossible to assess the degree of harmonisation for this indicator.

Data Sources

Please refer to **Appendix 2.7.1 (a)** for the sources of the data on the total and protected marine areas of Member States and Associate Members.

Evaluation

The data in **Table 7.1** were compiled for six member States and two Associate Members on *total* and *protected marine area* for the period 1970 to 2004. Most Member States reported a small percentage of *protected marine area* with the exception of Jamaica with almost 82 per cent of the total *marine area* of 1,815 squared kilometres protected in 2000. Bermuda reported the largest *marine area* at 428,738 squared kilometres of which 0.7 per cent was protected in 2004 with the *total protected marine area* increasing by 0.04 per cent since 1970.

Belize and The Turks and Caicos Islands reported the second and third largest proportions of *marine protected area* for the years 2000 and 2004 at 10.4 per cent and 10.3 per cent respectively with total areas of 23,654 squared kilometres and 7,200 squared kilometres respectively. The Bahamas, with a *total marine area* of 266,667 squared kilometres reported increases in the total *protected marine area* from 4.67 squared kilometres in 1970 to 4.77 squared kilometres for the period 1980 to 2000 finally to 16.75 squared kilometres in 2004. Total *protected marine area* for Saint Vincent and the Grenadines remained at 83 squared kilometres out of a total area of 27,500 squared kilometres for the period 1990 to 2004. Dominica reported a *total protected area* of 10.72 squared kilometres for 2000 and 2004 while Saint Lucia reported that there were 24 *marine protected areas* in 2000.

Table 7.1 Total and protected marine area: 1970, 1980, 1990, 2000, 2004

Country	Year	Marine Area	
		Total	Protected
Unit = km ²			
BS	1970	266,667	4.67
	1980	266,667	4.77
	1990	266,667	4.77
	2000	266,667	4.77
	2004	266,667	16.75
BZ	2000	23,655	2,452
	2004	23,655	2,452
DM	2000	...	10.72
	2004	...	10.72
JM	2000	1,815	1,483
LC	2000*	...	24
VC	1990	27,500	83
	2000	27,500	83
	2004	27,500	83
ASSOCIATE MEMBERS			
BM	1970	428,738	135
	1980	428,738	288
	1990	428,738	315
	2000	428,738	321
	2004	428,738	321
TC	1970	7,200	0
	1980	7,200	0
	1990	7,200	0
	2000	7,200	741
	2004	7,200	741

MR2: FISH LANDINGS BY TYPE AND BOAT DAYS**DK****Concepts and Definitions**

Fish landings are the part of the fish catch that is put ashore. (Please refer to the European Environmental Agency's website at http://glossary.eea.europa.eu/terminology/concept_html?term=fish%20landing [last accessed: June 19th 2009]).

A *boat day* is a measure of fishing effort (e.g. example, ten vessels in a fishery, each fishing for fifty days, would have expended five hundred boat-days of effort).

(Please refer to the Ocean Atlas's website at <http://www.fao.org/fi/glossary/default.asp> [last accessed: June 19th 2009])

Method of Computation

Data for this indicator were obtained from Member States/Associate Members and were classified according to the categories: Finfish, Fish Fillet, Tilapia, Lobster Head Meat, Lobster Tail, Whole Lobster, Conch, Stone Crab Claws, Grouper Roe, White Farmed Shrimp, Pink Sea Shrimp, Squid, Turtle, King Crab Claws, Post Larvae Shrimp, Farm Lobster, Whole Fish and Other.

Indicator Relevance

The biggest impact that fishing has on the environment is the removal of individuals from the population. Fish landing statistics do not, however, take into account those organisms that are caught but not landed—discards. These may be commercially valuable target species that are discarded for regulatory or marketing reasons, or non-target species. Most discarded species, especially fish and marine mammals, do not survive. Landing statistics, therefore, underestimate the total catch of fishing vessels and, thus, the impact on the environment. Despite this underestimation, however, fish landing statistics assessed against the state of the stock and its ability to recover do give an estimate of the environmental impacts of fishing that would have not been otherwise possible if landing statistics were not available.

Data Assessment

Data for this indicator were provided by eight Member States and two Associate Members: Bahamas, Belize, Dominica, Guyana, Jamaica, Saint Lucia, St. Vincent and the Grenadines, Suriname, Bermuda and The Turks and Caicos Islands. Despite this, however, there is very little detailed data for this indicator.

None of the reporting countries provided definitions used in the collection of this indicator and therefore it is impossible to assess the degree of harmonisation within the Region.

Data Sources

Please refer to **Appendix 2.7.2 (a)** for the sources of the data on the fish landing by type and boat days of Member States and Associate Members.

Evaluation

Data on *fish landings by type* and *fish landings by boat days* are presented below. It was difficult to compare *fish landings* given the vast differences in the species groups represented for the different time periods hence the data being presented by country below. It can be seen from the tables presented below that reported *fish landings* were highest for Guyana, Suriname and Belize in the Region. Data on *number of boat days spent* and *total catch* were captured for one Member State and one Associate Member and this does not therefore allow for much comparison.

Table 7.2 (a) Fish landings by type: 1990, 1995 - 2004

The Bahamas Fish landings by type: 1990, 1995 - 2004

Country	Year	Fish Species			Total
		Crustacean	Mollusc	Scalefish	
BS	1990	1,935	335	1,340	3,610
	1995	2,636	589	1,271	4,496
	1998	2,621	670	1,610	4,902
	1999	2,783	472	1,439	4,694
	2000	3,050	668	1,332	5,050
	2001	2,282	658	1,534	4,473
	2002	3,422	523	1,597	5,542
	2003	3,508	620	1,604	5,731
	2004	3,079	580	1,397	5,055

Belize Fish landings by type: 1995, 1998 - 2002

Country	Year	Fish Species						Stone Crab Claws
		Finfish	Fish Fillet	Lobster Head Meat	Lobster Tail	Whole Lobster	Conch	
BZ	1995	280,762	43,386	30,842	508,408	324,336	301,951	13,137
	1998	193,757	50,408	36,861	516,279	556,713	13,535	...
	1999	183,110	38,666	47,968	609,523	309,377	16,164	...
	2000	109,575	28,205	50,637	555,254	513,469	8,671	...
	2001	...	41,498	45,150	432,884	...	579,561	4,258
	2002	526,912	86,191	12,877	477,904	66,420	462,421	7,482

Belize Fish landings by type Cont'd: 1995, 1998 - 2002

Country	Year	Fish Species					Tonnes	
		Grouper Roe	White Farmed Shrimp	Pink Sea Shrimp	Squid	King Crab Claws	Whole Fish	Total Quantity
BZ	1995	882	1,048,431	107,956	213	2,104	...	2,662,408
	1998	74	3,620,151	89,185	172	...	...	5,077,135
	1999	352	6,974,120	76,616	214	...	...	8,256,110
	2000	...	8,002,118	99,285	555	...	...	9,367,769
	2001	...	9,812,135	151,750	...	...	81,528	11,148,764
	2002	321	1,083,158	106,312	...	...	...	2,829,998

Belize Fish landings by type Cont'd: 1995, 1998 - 2004

Country	Year	Fish Species					(in mT.)	
		Lobster Tail	Conch	Farmed Shrimp	Shrimp	Whole Fish	Other	Total Quantity
BZ	1995	392	137	768	79	147	7	1,530
	1998	251	253	1,871	40	111	6	2,532
	1999	298	140	3,170	35	101	8	3,752
	2000	275	233	3,630	45	62	4	4,249
	2001	217	263	4,451	69	56	2	5,057
	2002	288	187	4,345	121	83	1	5,025
	2003	271	241	11,134	52	34	1	11,734
	2004	278	282	11,042	74	27	3	11,706

Dominica Fish landings by type: 2000 - 2004

Country	Year	Fish Species				Total Quantity
		Coastal Pelagic Fishery	Offshore/large Pelagic Fishery	Reef Fishery	Other	
		(in mT.)	(in mT.)	(Tonnes)	(in mT.)	
DM	2000	...	...	...	...	495
	2001	172	297	56	56	525
	2002	303	338	...	...	641
	2003	169	196	39	39	404
	2004	108	250	45	45	403

Guyana Fish landings by type: 1997 - 2003

(in mT.)

Country	Year	Fish Species	
		Finfish	Shrimp
GY	1997	37,600	123,818
	1998	39,541	30,143
	1999	35,257	14,386
	2000	30,277	19,328
	2001	26,892	25,250
	2002	25,186	22,058
	2003	33,724	22,584

Jamaica Fish landings by type: 1997

Country	Year	Fish Species			
		Finfish (Tonnes)	Conch (in mT.)	Pelagic Fish (in mT.)	Total Quantity (in mT.)
JM	1997	4,476	1,805	1,116	7,747

Saint Lucia Fish landings by type: 1990, 1995, 1998-2004

(in mT.)

Country	Year	Fish Species				
		Dolphinfish	Wahoo	Flyingfish	Snapper	Shark
LC	1990	240	55	34	0	1
	1995	200	20	50	0	6
	1998	271	250	234	0	9
	1999	588	310	67	0	6
	2000	555	243	99	68	5
	2001	427	214	323	82	5
	2002	373	246	170	132	66
	2003	304	170	74	57	5
	2004	376	238	11	39	20

Saint Lucia Fish landings by type: 1990, 1995, 1998-2004

(in mT.)

Country	Year	Fish Species				Total Quantity
		Tunas	Lobster	Conch	Other	
LC	1990	127	4	4	97	562
	1995	300	13	15	407	1,011
	1998	395	20	42	304	1,525
	1999	324	23	90	421	1,829
	2000	473	25	40	352	1,860
	2001	404	36	41	435	1,967
	2002	219	58	31	317	1,612
	2003	486	23	60	349	1,528
	2004	419	11	46	362	1,520

Suriname Fish landings by type: 2000-2004

(in mT.)

Country	Year	Fish Species
		Finfish
SR	2000	8,871
	2001	12,202
	2002	10,937
	2003	12,000
	2004	18,647

Bermuda Fish landings by type: 1995, 1998-2004

(in mT.)

Country	Year	Fish Species								Total Quantity
		Snapper	Jacks	Shark	Tunas	Lobster	Grouper Roe	Bait	Other	
BM	1995	41	94	18	200	5	47	48	41	493
	1998	32	53	10	221	14	47	65	44	485
	1999	32	59	11	218	21	54	43	29	467
	2000	38	48	7	166	12	43	45	28	387
	2001	35	45	5	132	13	50	23	25	328
	2002	38	58	5	177	15	57	46	25	421
	2003	34	46	8	178	18	36	44	18	381
	2004	23	54	6	210	14	39	41	16	402

The Turks and Caicos Islands Fish landings by type: 1990, 1995, 1998-2004

(in mT.)

Country	Year	Fish Species			Total Quantity
		Lobster	Queen Conch ¹	Various Reef Fish ²	
TC	1990	328	424	15	767
	1995	284	953	1	1,238
	1998	315	645	...	941
	1999	187	737	1	925
	2000	291	817	1	1,109
	2001	323	725	4	1,052
	2002	182	655	3	840
	2003	278	720	...	998
	2004	388	680	...	1,057

Table 7.2 (b) Fish landings by Boat days: 1990, 1995 - 2004

Country	Year	Number of boats days spent	Total catch (tonnes)
BS	1990	12,333	1,334
	1995	16,534	1,146
	1998	17,818	1,814
	1999	13,505	1,530
	2000	12,838	1,390
	2001	13,940	1,530
	2002	13,354	1,474
	2003	14,501	1,568
	2004	10,930	954
	TC	1990	8,215	767
1995		10,097	1,238
1998		7,271	941
1999		6,714	925
2000		8,321	1,109
2001		8,848	1,052
2002		7,085	840
2003		5,460	998
2004		8,449	1,057

MR3: POPULATION OF COASTAL AREAS**DK****Concepts and Definitions**

Population of coastal areas is the percent of the total population living within one hundred kilometres of the coastline. A country might also consider percentage of population in the low elevation coastal zone (<10 meters elevation) or percentage of population in river deltas. *Please refer to http://www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets.pdf*

A *coastal area* is the part of the land affected by its proximity to the sea, and that part of the sea affected by its proximity to the land as the extent to which man's land-based activities have a measurable influence on water chemistry and marine ecology. (*Please refer to European Environment Agency's website at http://glossary.eea.europa.eu/EEAGlossary/C/coastal_area.*)

Method of Computation

Data for this indicator were collected from Member States and Associate Members according to the categories: population in coastal areas and number of families in coastal areas.

Indicator Relevance

The natural environment of coastal areas, which includes wetlands, estuaries, mangroves and coral reefs, is degraded by agricultural and urban development, industrial facilities, port and road construction, dredging and filling, tourism and aquaculture. Natural landscapes and habitats are altered, overwhelmed and destroyed to accommodate the growing coastal population. Dam construction, even far inland, can alter water flow patterns that support important fisheries, as well as cut off the supply of sediment necessary to maintain deltas and coastlines. As more people gravitate towards the coast, increasing volumes of waste, particularly sewage, are produced and sluiced out into coastal waters, which then causes eutrophication and endanger public health. This indicator, therefore, acts as a measure of population growth in coastal areas to provide an estimation of the pressures on the environment that will arise as a result of habitation of the coast.

Data Assessment

Data for this indicator were obtained from two Member States and two Associate Members: Dominica and Suriname and Bermuda and The Turks and Caicos Islands.

Data were requested for six years: 1980, 1985, 1990, 1995, 2001 and 2004. Dominica and Suriname provided data for one of the years: Dominica for 2001 and Suriname for 2004. Bermuda provided data for two of the requested years: 1980 and 1990, and also provided data for 2000. Like Bermuda, and The Turks and Caicos Islands provided data for 2000, but they also provided data for all of the requested years save 2001

It is impossible to assess the degree of harmonisation of this indicator within the Region since none of the reporting countries provided definitions used in the collection of this indicator.

Data Sources

Please refer to **Appendix 2.7.3 (a)** for the sources of the data on the total and protected marine areas of Member States and Associate Members.

Evaluation

Table 7.3 presents data on the *number of families* and the *population of coastal area* in reporting Member States Dominica and Suriname and Associate Members Bermuda and The Turks and Caicos Islands. The data shows that 15,500 persons consisting 5,105 *families lived in coastal areas* in 2001 in Dominica whilst Suriname reported that 458,822 persons lived on the coast in 2004.

The total *population living in coastal areas* in Bermuda increased from 54,050 persons in 1980 to 58,460 persons in 1990 and finally to 62,059 in 2000. Bermuda also reported an increase in the number of families inhabiting coastal areas from 22,430 in 1990 to 25,148 in 2000. The Turks and Caicos Islands reported that 100 per cent of the population inhabited coastal area for all years.

Table 7.3 - Number of families and Population of coastal area : 1980, 1985, 1990, 1995, 2000 - 2001, 2004

Country	Year	Population in coastal area	Number of families in coastal areas
DM	2001	15,500	5,105
SR	2004	458,822	...
ASSOCIATE MEMBERS			
BM	1980	54,050	...
	1990	58,460	22,430
	2000	62,059	25,148
TC		(per cent)	
	1980*	100	...
	1985*	100	...
	1990*	100	...
	1995*	100	...
	2000*	100	...
	2004*	100	...

Appendix 1.7 Conversion Table

Metric	to	Imperial
2 hectares (ha)		5 acres
1 km ² (squared kilometres)		250 acres
8 km ² (squared kilometres)		3 square miles (mi ²)

Appendix 2.7

2.7.1(a): Sources of Data for Table 7.1 - Total and Protected Marine Area: 1970, 1980, 1990, 2000, 2004

Country	Data Source
THE BAHAMAS	Bahamas National Trust
BELIZE	Land Information Centre
DOMINICA	Fisheries Division, Ministry of Agriculture
JAMAICA	National Environment and Planning Agency
SAINT LUCIA	Department of Fisheries, Ministry of Agriculture, Forestry and Fisheries
ST VINCENT AND THE GRENADINES	Department of Statistics
BERMUDA	Bermuda Biodiversity Country Study
THE TURKS AND CAICOS ISLANDS	Department of Environment and Coastal Resources

2.7.1(b): Notes for Table 7.1 - Total and Protected Marine Area: 1970, 1980, 1990, 2000, 2004

Country	Notes
BELIZE	Area is GIS area and not the area on the legal statutory instrument.
DOMINICA	Only Two Marine Reserves. Cabrits National Park (Marine Section): 1054 acres and Soufriere/Scott's Head Marine Reserve: 6.5 km ²
SAINT LUCIA	* - Area of protected marine area not available. Number of marine protected areas given.
ST VINCENT AND THE GRENADINES	Protected Marine Areas are only in coastal areas, less than five miles from shore. Protected marine areas enacted in 1987. Total marine areas declared according to Law of the Sea Convention.
BERMUDA	The Exclusive Economic Zone around Bermuda was declared in 1996. This gives Bermuda jurisdiction over an area of about 125,000 square nautical miles. This area was declared a marine mammal preserve in 2000.
THE TURKS AND CAICOS ISLANDS	The protected marine area for 2000 and 2004 correspond to 19 Marine National Parks. The protected area was legally/formally established in 1992 hence 1970, 1980, and 1990 data points are not applicable for protected marine area.

2.7.2(a): Sources of Data for Table 7.2: Fish Landings by Type and Boat Days: 1990, 1995 – 2004

Country	Data Source
THE BAHAMAS	Department of Fisheries
BELIZE	Statistical Records, Belize Fisheries Department, Ministry of Agriculture and Fisheries
DOMINICA	Fisheries Division
GUYANA	Bureau of Statistics
JAMAICA	Fisheries Division
SAINT LUCIA	Department of Fisheries, Ministry of Agriculture, Forestry and Fisheries
SURINAME	General Bureau of Statistics
BERMUDA	Department of Statistics.
THE TURKS AND CAICOS ISLANDS	Department of Environmental and Coastal Resources

2.7.2(b): Notes for Table 7.2 - Fish Landings by Type and Boat Days: 1990, 1995 – 2004

Country	Notes
THE BAHAMAS	Fish landings by boat do not reflect total Bahamas landing. These are the landing collected by our data collectors. Conch = Queen Conch. Stone Crab includes spiny lobster. Grouper Roe refers to groupers, jacks, snappers, grunts, etc.
DOMINICA	Whole fish = fish landings at a coastal pelagic fishery and an offshore/large pelagic fishery. Other refers to reef fish
GUYANA	Fin-fish is derived from fin-fish production data. White farmed shrimp refers to shrimp and is derived from shrimp production data. Other refers to all other kinds of fish landings.
JAMAICA	All data represents marine capture by type. Whole fish = tilapia. White Farmed Shrimp = Shrimp
SAINT LUCIA	* Other = dolphin fish + wahoo + flying fish + snapper + shark + tuna + other
SURINAME	General Bureau of Statistics
BERMUDA	Department of Statistics collected quantity information in lbs and converted into mT. Other includes jacks, snappers, miscellaneous, tuna and sharks.
THE TURKS AND CAICOS ISLANDS	The figures in the quantity lines reflect total catch, that is, the quantity sold to the fish processors but exclude any direct sales to local restaurants and hotels. Fluctuations in catch levels are presumed to be resultant of over-fishing in combination with independent factors such as climate change. Conch = Queen Conch: ¹ Catch levelled at the current quote or Total Allowable Catch (TAC) level of approximately 1,657,876 (752 mT.). ² Other refers to various reef fish which include species such as groupers, snappers and large pelagic.

2.7.3(a): Source of Data for Table 7.3 - Number of Families and Population of Coastal Areas: 1980, 1985, 1990, 1995, 2000 – 2001, 2004

Country	Data Source
DOMINICA	Population and Housing Census, 2000 Round
SURINAME	Preliminary Census 2004 Figures
BERMUDA	Population and Housing Census, 2000 Round
THE TURKS AND CAICOS ISLANDS	Department of Environmental & Coastal Resources

**2.7.3(b): Notes for Table 7.3 - Number of Families and Population of Coastal Areas:
1980, 1985, 1990, 1995, 2000 – 2001, 2004**

Country	Notes
BERMUDA	Data represent total households and total population in Bermuda. Bermuda measures 1 mile at its widest point. Based on the standard definition of coastal area, the entire island is considered coastal.
THE TURKS AND CAICOS ISLANDS	* - Figures are percentages.

BIO1: MDG 7: ENSURE ENVIRONMENTAL SUSTAINABILITY**Protected Area as a Percentage of Total Area****Ratio of area protected to maintain biological diversity to surface area****PH****Target 9: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources****Concept and Definition**

A *protected area* is defined as an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal and effective means. (Legal or effective means refers to the objectives of the Act under which an area is designated and implies security of tenure, generally revoked only by a state or national parliamentary process; or areas covered by a legally adopted plan of management.)

A protected area includes six categories, which are:

- Category I(a): Strict Nature Reserve
- Category I(b): Wilderness Area
- Category II: National Park
- Category III: National Monument
- Category IV: Habitat/Species Management Area
- Category V: Protected Landscape/Seascape
- Category VI: Managed Resource Protected Area

(Please refer to http://www.iucn.org/about/union/commissions/wcpa/wcpa_overview/ [last accessed: June 19th 2009])

Method of Computation

The indicator is expressed as the ratio of Total Protected Area over Total Territorial Area.

Numerator:

Total Protected Area = Total Terrestrial Protected Area + Total Marine Protected Area.

Denominator:

Total Territorial Area = Total (terrestrial/surface) Area + Total Territorial Waters (up to 12 nautical miles)

where

Total (terrestrial/surface) area = Total Land Area + Land under Inland Waters (rivers and lakes).

The usefulness of the indicator depends on clearly distinguishing totally protected areas and partially protected areas, since they have very different, albeit complementary, functions. This is done by calculating the combined area of totally protected areas of one thousand hectares or more and the combined area of all partially protected areas, regardless of size. The percentage of the total land and marine area occupied by each group is then calculated to provide the total protected area.

Indicator Relevance

Biodiversity of natural and man-made ecosystems has its own intrinsic value whose maintenance is essential for the state of the ecosystems, human life and sustainable development. The main threats to biodiversity relate to the destruction and/or fragmentation of ecosystems due to human activities (such as massive deforestations, expansions in agricultural activities and fishing, urbanisation, and transportation networks) and to natural activities (such as climatic variations).

Protected areas are an essential tool for ecosystem conservation, with functions going well beyond the conservation of biological diversity. As such, they are one of the building blocks of sustainable development. As such, this indicator represents the extent to which areas important for conserving biodiversity, cultural heritage, scientific research (including baseline monitoring), recreation, natural resource maintenance, and other values, are protected from incompatible uses. It shows how much of each major ecosystem is dedicated to maintaining its diversity and integrity.

However, the effectiveness of this indicator is limited by two problems. First, it represents *de jure*, not *de facto* protection. It does not indicate the quality of management or whether the areas are in fact protected from incompatible uses. Secondly, the indicator does not show how representative the protected areas are of the country's ecological diversity. This is a significant deficiency since a large proportion of some ecosystems may be protected to the neglect of others.

Data Assessment

Nine Member States and three Associate Members provided data for this indicator. The Member States were The Bahamas, Belize, Dominica, Guyana, Jamaica, St. Lucia, St. Vincent and the Grenadines, Suriname and Trinidad and Tobago while the Associate Members were Anguilla, Bermuda and The Turks and Caicos Islands. The data provided was reasonably dense and detailed.

For the protected area, Belize reported protected land area while Trinidad and Tobago reported the protected forest area. In addition, Trinidad and Tobago reported protected forest area as a percentage of total land area for protected area as a percentage of total

area. All data from St. Vincent and the Grenadines refer only to areas of the sea. Instead of providing data for the current protected areas, Suriname provided the total area of current protected areas and proposed protected areas. For the total area, the Bahamas reported only the total land area. All of the other reporting countries reported data that was in strict accordance with the international concept of a protected area. As a result of these differences in the data provided by the Member States and Associate Members, this indicator is partially harmonized.

Data Sources

Please see **Appendix 2.8.1** for the sources of the data on protected area as a percentage of total area of Member States and Associate Members. Notes to the tables are also provided.

Evaluation

Nine Member States and three Associate Members reported data for this indicator which is shown in **Table 8.1** below. Among Member States, Belize reported the highest proportion of *protected land area*, which fluctuated between 1995 and 2004, increasing from 7,290 (31.7 per cent) in 1995, to 7,974 (34.7 per cent) in 1998, then to 8,046 (35.0 per cent) in 2000 and further to 8,246 (35.9 per cent) in 2001 and registered a small decline in 2004 to 7,930 (34.5 per cent). This was followed by Trinidad and Tobago with 25.6 per cent of its total area of 5,128 squared kilometres protected for the period 1970 to 2004.

Dominica's *protected area as a percent of total area* of 750 squared kilometres increased for the period 1970 to 2004 from 0.1 per cent (4.1 squared kilometres) in 1970 to 23.1 per cent in 2004. The Bahamas recorded increases in the *proportion of protected area* from 8.6 percent in 1970 to 19 percent in 2007 an increase of 10.4 percent. Suriname's *protected area as a percent of total area* of 163,820 squared kilometres was 13 percent from 2000 to 2002 and 14 percent in 2003 and 2004. The *total protected area as a percent of total land area* for Jamaica in 1999 and 2002 was 12.8 percent of the total land area of 11,425 squared kilometres. The remaining Member states were Guyana, reporting 2 percent of its total area (216,000 squared kilometres) protected in 2004, Saint Vincent and the Grenadines with a *total protected area* of 83 squared kilometres during the period 1990 to 2004 representing 0.3 percent of the total area of 27,500 squared kilometres and Saint Lucia whose *total protected area* represented 0.2 percent of the total area which was 616.4 squared kilometres.

Two Associate Member States reported high percentages of *protected areas as a percent of total area* and these were Bermuda and The Turks and Caicos Islands. Bermuda, whose total area was 55 squared kilometres, reported 15 percent of its total area as protected whilst The Turks and Caicos Islands reported 83.2 percent for the period 1995 to 2002 and 83.7 percent for 2003 and 2004 of its total area of 948.2 squared kilometres protected. The remaining Associate Member State, Anguilla recorded protected area as 0.05 squared kilometres, which represents 0.1 percent of its total area of 91 squared kilometres for the years 2002 to 2004.

Table 8.1 - Protected Area as a percentage of Total Area: 1970, 1980, 1990, 1995, 1998 - 2004

Unit: km²

Country	Year	Total Area	Protected Area	Protected Area as a % of Total Area	
BS	1970	13,940	1,199	8.6	
	1980	13,940	1,217	8.7	
	1990	13,940	1,217	8.7	
	1995	13,940	1,300	9.3	
	1998	13,940	1,300	9.3	
	1999	13,940	1,300	9.3	
	2000	13,940	1,300	9.3	
	2001	13,940	1,300	9.3	
	2002	13,940	2,651	19.0	
	2003	13,940	2,651	19.0	
	2004	13,940	2,651	19.0	
	BZ	1970	22,966
		1980	22,966
1990		22,966	...	...
1995		22,966	7,290	31.7	
1998		22,966	7,974	34.7	
1999		22,966	...	...
2000		22,966	8,046	35.0	
2001		22,966	8,246	35.9	
2002		22,966	...	...
2003		22,966	...	...
2004		22,966	7,930	34.5	
DM	1970	750	4	0.6	
	1980	750	128	17.1	
	1990	750	129	17.3	
	1995	750	129	17.3	
	1998	750	140	18.7	
	1999	750	140	18.7	
	2000	750	174	23.1	
	2001	750	174	23.1	
	2002	750	174	23.1	
	2003	750	174	23.1	
	2004	750	174	23.1	
GY	2004	216,000	4,245	2.0	
JM	1999	11,425	1,462	12.8	
	2002	11,425	1,462	12.8	
LC	2004	616	2	0.2	

Table 8.1 - Protected Area as a percentage of Total Area: 1970, 1980, 1990, 1995, 1998 - 2004

		Unit: km ²		
Country	Year	Total Area	Protected Area	Protected Area as a % of Total Area
VC	1990	27,500	83	0.3
	1995	27,500	83	0.3
	1998	27,500	83	0.3
	1999	27,500	83	0.3
	2000	27,500	83	0.3
	2001	27,500	83	0.3
	2002	27,500	83	0.3
	2003	27,500	83	0.3
	2004	27,500	83	0.3
	SR	2000	163,820	20,850
2001		163,820	20,850	13.0
2002		163,820	20,850	13.0
2003		163,820	22,665a	14.0
2004		163,820	22,665a	14.0
TT	1970	5,128	1,314	25.6
	1980	5,129	1,314	25.6
	1990	5,130	1,314	25.6
	1995	5,131	1,314	25.6
	1998	5,132	1,314	25.6
	1999	5,133	1,314	25.6
	2000	5,134	1,314	25.6
	2001	5,135	1,314	25.6
	2002	5,136	1,314	25.6
	2003	5,137	1,314	25.6
	2004	5,138	1,314	25.6
ASSOCIATE MEMBERS				
AI	2002	91	0.1	0.1
	2003	91	0.1	0.1
	2004	91	0.1	0.1
BM	1970	55	...	...
	1980	55	...	...
	1990	55	...	...
	1995	55	...	...
	1998	55	...	...
	1999	55	...	...
	2000	55	15	26.8
	2001	55	15	26.8
	2002	55	15	26.8
	2003	55	15	26.8
2004	55	15	26.8	
TC	1970	948	-	-
	1980	948	-	-
	1990	948	-	-
	1995	948	792	83.5
	1998	948	792	83.5
	1999	948	792	83.5
	2000	948	792	83.5
	2001	948	792	83.5
	2002	948	792	83.5
	2003	948	794	83.7
	2004	948	794	83.7

Appendix 1.8 Conversion Table

Metric	to	Imperial
2 hectares (ha)		5 acres
1 square kilometre (km ²)		250 acres
8 square kilometres (km ²)		3 square miles (mi ²)

Appendix 2.8

2.8.1(a): Sources of Data for Table 8.1 - Protected Area As A Percentage of Total Area: 1970, 1980, 1990, 1995, 1998 - 2004

Country	Data Source
THE BAHAMAS	Bahamas National Trust
BELIZE	Land Information Centre, Ministry of Natural Resources and the Environment
DOMINICA	Fisheries and Forestry Division, Ministry of Agriculture
GUYANA	Bureau of Statistics
JAMAICA	National Environment and Planning Agency and UNEP
SAINT LUCIA	Saint Lucia National Trust
ST. VINCENT AND THE GRENADINES	Fisheries Division
SURINAME	Institute for Forest Management and Control
TRINIDAD AND TOBAGO	Central Statistical Office
ANGUILLA	Anguilla Statistics Department
BERMUDA	Department of Statistics
THE TURKS AND CAICOS ISLANDS	Department of Environmental and Coastal Resources

2.8.1 (b): Notes for Table 8.1 - Protected Area As A Percentage of Total Area: 1970, 1980, 1990, 1995, 1998 - 2004

Country	Notes
BELIZE	Protected Area has been modified to PROTECTED LAND AREA. It refers to protected areas in Belize which includes land area and inland waters but excludes sea protected areas. Protected Sea Area (which refers to MARINE RESERVES) is also available and is excluded from Protected Land Area. The data has been classified in this manner because using one figure for protected land and marine areas creates a false figure for protected area as a % of total area. It is quite high (over 45%). The area used in the calculations are GIS areas and not the area stipulated on the legal statutory instruments. Although the area on the Statutory Instruments are the legal one, the GIS area is more accurate.
JAMAICA	Total land area = 10,990.5km ² . Total land and sea area is from UNEP
ST. VINCENT AND THE GRENADINES	The figures presented represent areas of sea only
SURINAME	a - Protected areas and Proposed Protected Areas
TRINIDAD AND TOBAGO	The protected area data submitted is the protected forest area. Data submitted for Protected Area as a Percentage of Total Area refers to protected forest area as a percentage of total land area.
ANGUILLA	There is no legal framework in Anguilla for naming an area as a protected area. However, the government has vested these areas to the National Trust to be protected.
BERMUDA	By definition the marine protected areas fall into this category as well. Total land protected area is 1,473 ha (14.73 km ²) and marine protected area is 32,095 ha (320.95 km ²) giving a total area of 335.68km ² . Seeing that 14.73 km ² of the 55kmsq is protected area, then this will be subtracted to give a total area of 375.95km ² (335.68+55=390.68 km ² -14.73km ² =375.95 km ²)

FOR1: MDG 8: ENSURE ENVIRONMENTAL SUSTAINABILITY
Protected Forest Area as a percentage of Total Land Area**H****Target 9: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources****Concept and Definition**

A *protected area* is defined as an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal and effective means. (Legal or effective means refer to the objectives of the Act under which an area is designated and implies security of tenure, generally revoked only by a state or national parliamentary process; or areas covered by a legally adopted plan of management.)

A protected area includes six categories, which are:

- Category I(a): Strict Nature Reserve
- Category I(b): Wilderness Area
- Category II: National Park
- Category III: National Monument
- Category IV: Habitat/Species Management Area
- Category V: Protected Landscape/Seascape
- Category VI: Managed Resource Protected Area

(Please refer to http://www.iucn.org/about/union/commissions/wcpa/wcpa_overview/ [last accessed: June 19th 2009].)

Forest is land spanning more than 0.5 hectares with trees higher than 5 metres and a canopy cover of more than 10 per cent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use but does include areas under reforestation that have not yet reached, but are expected to reach, a canopy cover of 10 per cent and a tree height of 5 metres. It also includes temporarily unstocked areas, resulting from human intervention or natural causes, which are expected to regenerate.

Protected forest area as a percentage of total land area is the area of protected forest as a share of total land area, where land area is the total country area excluding the area of inland water bodies (major rivers, lakes and water reservoirs).

Method of Computation

The measurement methods for forest area can be contained in national forest inventories or assessments, and the estimate is obtained by sampling ground surveys, cadastral surveys, remote sensing, or a combination of these. The forest area is calculated

as the sum of plantations and natural forest areas with tree crown cover equal to and more than 10 percent.

Since forest resources assessments are expensive and thus rarely undertaken annually, the forest area for a given reference years is estimated through inter- or extrapolation. The areas of forest and primary forest are then presented as the percentages of the land area.

Protected Forest Area as a Percentage of Total Land Area =

$$\frac{\text{Protected Forest Area}}{\text{Total Land Area}} \times 100$$

Indicator Relevance

Forests serve multiple ecological, socioeconomic, and cultural roles in many countries. They are among the most diverse and widespread ecosystems of the world. Forests provide many significant resources and functions including: wood products, recreational opportunities, habitat for wildlife, water and soil conservation, and a filter for pollutants. They support employment, traditional uses, and biodiversity. There is general concern, however, over the human impact on forest health and the natural processes of forest growth and regeneration. Protected forest area as a percentage of total land area measures the societal response to protect biodiversity and landscapes through the creation of representative reserves of various forest ecosystems.

This indicator represents only one element of a sound forest conservation policy aimed at sustainable development and measures the part of the total forest area which has been delineated for protection purposes. It includes areas established to protect wildlife, special ecosystems, and soil and water resources. The higher the protected forest area as a percentage of total land area, the better the performance of the country in protecting and conserving its forest resources.

It should be noted, however, that the indicator is limited to forest ecosystems only. It does not provide information on the ecological value of the protected areas. A country can set aside large areas of forests with a low importance for biological diversity and continue to unsustainably harvest high valuable non-protected forests. The indicator says nothing about the effectiveness of the protection; either from the viewpoint of ecological representivity or management and law enforcement. Ideally, the protected forest area should cover representative examples of all existing forest ecosystems, with the area appropriate to their rarity or uniqueness. (*Please refer to the United Nations Methodological Sheets at http://esl.jrc.it/envind/un_meths/UN_ME109.htm.*)

Data Assessment

Internationally recommended definition was provided for this indicator by reporting countries none of which indicated that they had deviated from the international definition of a forest. This indicator is conceptually harmonized.

The comparability of the data is, nonetheless, affected since for 2003 and 2004, Suriname reported data that represented protected and proposed protected forest areas instead of data of protected forest area only.

Data Sources

Data for the indicator was collected from Member States and Associate Members. Please see **Appendix 2.9.1** for details, along with notes to the table.

Evaluation

Table 9.1 presents the *Total Forest Area*, *Protected Forest Area*, *Protected Forest Area as a per cent of Total Forest Area* and the *Total Forest as a per cent of total land area* for reporting CARICOM Member States. *Total forest area* was found to be greater in the non-island Member States Guyana (168,789 squared kilometres), Suriname (148,000 squared kilometres) and Belize (15,867 squared kilometres). Among island States, Jamaica reported the largest *forest area* which declined by 35 per cent from 5,316 squared kilometres in 1980 to 3,439 squared kilometres in 1989 and further to 3,402 squared kilometres in 1996. Trinidad and Tobago reported an increase in *total forest area* from 2,300 squared kilometres in 1995 to 2,637 squared kilometres for the period 1996-2004. In the remaining Member States, St. Vincent and the Grenadines reported declines in the *total forest area* from 185 squared kilometres in 1990 to 121 squared kilometres in 2004 representing a decline of 34.6 per cent, Saint Lucia reported 75 squared kilometres of total forest area in 2002 and Dominica reported 60 squared kilometres of forest area for the period 1980 to 2004.

Eight countries reported data for *protected forest area* out of nine countries submitting data for this indicator. Overall St. Vincent and the Grenadines had the highest proportion of its *forest area protected* (130 squared kilometres) with its percentage ranging between 70 per cent and 100 per cent. This also represented 38.2 per cent of *protected forest area as a per cent of land area*. Trinidad and Tobago followed with an increase from 1,504 squared kilometres or 65.4 per cent of *total forest area* to 1,961 squared kilometres or 75 per cent of *total forest area*. The *protected forest area as a per cent of land area* in this Member State increased from 29.3 per cent in 1995 to 38.6 per cent for the period 1996 to 2004. Saint Lucia reported 33 squared kilometres or 44.3 per cent of its *total forest area* as protected which also represents 0.1 per cent of its total land area in 2002. 1,193 squared kilometres or 35.1 per cent of Jamaica's *total forest area* was protected. This also represents 10.9 per cent of Jamaica's total land area. Belize reported *protected forest area as a per cent of total forest area* at 25.7 per cent in 1998 and *protected forest area as a per cent of total land area* fluctuating from 18.8 per cent in 1995 to 17.7 per cent for the period 1996 to 1998 increasing slightly to 17.9 per cent in 2001 then further by 6.7 percent to 19.1 per cent in 2001 and finally decreasing to 16.9 per cent in 2004. Dominica reported its *protected forested area as a per cent of total land area* at 7.95 per cent during the period 1980 to 2004.

Suriname's *protected forest area* remained fixed throughout the period 1990-2004 (20,850 squared kilometres or 14 per cent of *total forest area*). 2003 and 2004 included 1,815 squared kilometres of proposed *protected forest area* which increased *protected forest area as a per cent of total forest area* by 1 percent. Suriname's *protected forest area as a per cent of total land area* was 13 per cent from 1990 to 2002 and 14 per cent in 2003 and 2004. Of the total 68,789 squared kilometres forest area of Guyana, 2.2 per cent (3,662 squared kilometres) has protected forest cover.

Table 9.1 Protected Forest Area as a Percentage of Total Land Area: 1980, 1989 - 1990, 1995, 1998 - 2004

Country	Year	Total forest area km ²	Protected forest area km ²	Protected forest area as a per cent of Total forest area	Protected forest area as a per cent of Total land area
BZ	1995	...	4,319	...	18.80
	1996/1998	15,867	4,074	25.70	17.70
	2000	...	4,111	...	17.90
	2001	...	4,378	...	19.10
	2004	...	3,885	...	16.90
DM	1980	60	...	...	7.95
	1990	60	...	...	7.95
	1995	60	...	...	7.95
	1998	60	...	...	7.95
	1999	60	...	...	7.95
	2000	60	...	...	7.95
	2001	60	...	...	7.95
	2002	60	...	...	7.95
	2003	60	...	...	7.95
2004	60	...	...	7.95	
GY	2001	168,789	3,662	2.17	1.70
JM	1980	5,316	...	...	...
	1989	3,439	...	...	...
	1998	3,402	1,193	35.07	10.90
LC	2002	75	33	44.26	0.05
VC	1990	185	130	70.36	38.22
	1995	155	130	83.91	38.22
	1998	143	130	91.47	38.22
	2000	138	130	94.29	38.22
	2001	134	130	97.30	38.22
	2002	130	130	100.51	38.22
	2003	126	130	103.94	38.22
2004	121	130	107.61	38.22	
SR	1990	148,000	20,850	14.00	13.00
	1995	148,000	20,850	14.00	13.00
	1998	148,000	20,850	14.00	13.00
	1999	148,000	20,850	14.00	13.00
	2000	148,000	20,850	14.00	13.00
	2001	148,000	20,850	14.00	13.00
	2002	148,000	20,850	14.00	13.00
	2003	148,000	22,665a	15.00	14.00
2004	148,000	22,665a	15.00	14.00	
TT	1995	2,300	1,504	65.39	29.33
	1998	2,637	1,981	75.12	38.63
	1999	2,637	1,981	75.12	38.63
	2000	2,637	1,981	75.12	38.63
	2001	2,637	1,981	75.12	38.63
	2002	2,637	1,981	75.12	38.63
	2003	2,637	1,981	75.12	38.63
	2004	2,637	1,981	75.12	38.63

Appendix 1.9

Conversion Table

Metric	to	Imperial
2 hectares (ha)		5 acres
1 square kilometre (squared kilometres)		250 acres
8 square kilometres (squared kilometres)		3 square miles (mi ²)

Appendix 2.9

2.9.1 (a): Sources of Data for Table 9.1 - Protected Forest Area as a Percentage of Total Land Area: 1980, 1989 – 1990, 1995, 1998 - 2004

Country	Data Source
Belize	Environmental Statistics Unit, Ministry of Natural Resources
Dominica	Forestry Parks and Wildlife Division
Guyana	Guyana Forestry Commission
Jamaica	Forestry Department
Saint Lucia	Forestry Department, Ministry of Agriculture, Forestry and Fisheries
St. Vincent and the Grenadines	Forestry Department
Suriname	Institute for Forest Management and Control
Trinidad and Tobago	Forestry Division

2.9.1 (b): Notes for Table 9.1 - Protected Forest Area as a Percentage of Total Land Area: 1980, 1989 – 1990, 1995, 1998 - 2004

Country	Notes
Belize	*: 1998 data refers to a study conducted in 1996/1998
Guyana	Protected Areas: Forest by Environmental Protection Agency 2001. Total forest area refers to forest cover.
St. Vincent and the Grenadines	The data relates only to mainland St. Vincent and do not include private forest below 1000 ft. a.s.l (air speed indicator). It is also based on linear regression around 1990 figures
Suriname	a: protected areas and proposed protected areas.

AIR1: EMISSIONS OF SULPHUR DIOXIDE (SO₂)**H****Concept and Definition**

Sulphur dioxide, or SO₂, belongs to the family of sulphur oxide gases (SO_x). These gases dissolve easily in water. Sulphur is prevalent in all raw materials, including crude oil, coal, and ore that contains common metals like aluminium, copper, zinc, lead, and iron. SO_x gases are formed when fuel-containing sulphur, such as coal and oil, is burned, and when gasoline is extracted from oil, or metals are extracted from ore. SO₂ dissolves in water vapour to form acid, and interacts with other gases and particles in the air to form sulfates and other products that can be harmful to people and their environment.

Over 65% of SO₂ released to the air, or more than 13 million tons per year, comes from electric utilities, especially those that burn coal. Other sources of SO₂ are industrial facilities that derive their products from raw materials like metallic ore, coal, and crude oil, or that burn coal or oil to produce process heat. Examples are petroleum refineries, cement manufacturing, and metal processing facilities. Also, locomotives, large ships, and some nonroad diesel equipment currently burn high sulphur fuel and release SO₂ emissions to the air in large quantities. (see <http://www.epa.gov/air/urbanair/so2/> [last accessed: July 14th 2009]).

Definitions of selectable source categories

Fuel combustion (Sectoral Approach): Total emissions of all greenhouse gases from all fuel combustion activities.. Other greenhouse gases from biomass fuel combustion are considered net emissions and are included. Incineration of waste for waste-to-energy facilities are included here and not under Waste. Emissions from fuel used in ships or aircraft engaged in international transport are not included here.

Energy Industries comprises emissions from fuels combusted by the fuel extraction or energy producing industries.

Transport: Emissions from the combustion and evaporation of fuel for all transport activity, regardless of the sector. Emissions from fuel sold to any air or marine vessel engaged in international transport (international bunker fuels) are not included.

Industrial Processes: By-product or fugitive emissions of greenhouse gases from industrial processes. Emissions from fuel combustion in industry are included under Fuel Combustion.

Solvent and Other Product Use: Emissions resulting from the use of solvents and other products containing volatile compounds. When the solvents and other products are, or are produced from, petroleum products, the carbon in the NM-VOC emissions will be included in the CO₂ inventory if the Reference Approach for CO₂ emissions from energy is used. All other non-energy emissions not included under Industrial Processes are included here.

Agriculture: All anthropogenic emissions from agriculture except for fuel combustion and sewage emissions.

Other: Emissions that do not fit under any other emission source/sink categories of the main categories described above.

Method of Computation

Air emissions data are usually estimated according to international methodologies on the basis of national statistics on energy balances, industrial and agricultural production, waste management and land use, etc. The most accepted and well-known methodologies are the revised 1996 Guidelines of the Intergovernmental Panel for Climate Change (IPCC) (see <http://www.ipcc-nggip.iges.or.jp/public/gl/invs4.html> [last accessed: July 2nd 2009]) which is the basis for reporting to the United Nations Framework Convention for Climate Change (UNFCCC) (see: <http://unfccc.int/index.html>). These are linked to the UNECE EMEP/CORINAIR Atmospheric Inventory Guidebook (see <http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html> [last accessed: July 2nd 2009]).

Sulphur dioxide emissions are measured (and regulated, where appropriate) for a number of activities, for example electric power plants and large industrial installations. For those activities for which direct measurements are not directly available, it is possible to estimate emissions by considering the amount of fuel consumed, together with emission factors related to particular combustion processes. In order, however, to determine the appropriate emission factor for these activities it is imperative to have relevant statistical data related to the fuel characteristics, and machinery specifications, taking into account the effects of various control techniques (e.g. disulphurisation units etc.). It must be noted that detailed methodologies (such as the CORINAIR programme) already exist for the estimation of SO₂ emissions from all anthropogenic activities. The unit of measurement is Kt SO₂ per year.

Indicator Relevance

Sulphur dioxide emissions are partly responsible for acid depositions on the surface and the occurrence of winter smog episodes. In addition, the oxidisation of SO₂ has also been found to contribute to visibility degradation due to high concentrations of aerosol sulphates in the atmosphere.

Data Assessment

All reporting Member States followed the internationally recommended definitions for emissions of Sulphur dioxide. This indicator is, therefore, regionally and internationally conceptually harmonized.

Only two of the reporting eighteen Member States/Associate Members of the Community provided data for this indicator.

Data Sources

In accordance with the decision that the UNSD would provide data on waste, water, land, and air to the CARICOM Secretariat, data for this indicator was collected from the UNSD instead of from Member States and Associate Members.

Please refer to **Appendix 1.10.1 (a)** for the original sources of the data, as specified by the UNSD, on air for Member States and Associate Members.

Evaluation

Tables 10.1 (a) and (b) show estimated SO₂ emissions for Jamaica in 1994 and for Trinidad and Tobago in 1990 and 1996. The data shows that *Manufacturing industries and construction* in Jamaica accounted for 63 per cent of total emissions reported for *energy activities and industrial processes* only, with a further 30 per cent coming from *fuel use* in energy industries. Emissions from *road transport* registered 2.1 thousand tonnes or 2 per cent of total emissions while emissions from *other fuel combustion* were estimated at 3.59 thousand tonnes. Jamaica also reported *total fugitive emissions* from fuels at 0.61 thousand tonnes.

Total SO₂ emissions in Trinidad and Tobago in 1990 and 1996 were 8.7 and 8.6 thousand tonnes respectively. According to the Environmental Management Authority of Trinidad and Tobago, *industrial processes* accounted for 3 per cent of total reported emissions while *energy activities* (fuel combustion in energy industries, industry, and transport, plus industrial processes) represented 97 per cent of the total sulphur dioxide emissions in 1990. The per cent share of *industrial processes* in total emissions declined to 2 per cent in 1996. *Emissions from transport* accounted for 70 per cent of total emissions reported for *energy activities* in 1996 followed by the *Energy Industry* (20 per cent) and *Manufacturing industries and construction* (8 per cent).

Table 10.1 (a) - Emissions of Sulphur Dioxide (SO₂): 1990, 1994 and 1996

(1000 t)

Country	Year	TOTAL emissions	TOTAL Energy activities	Industrial processes	Solvent use	Agriculture	Other sources of emissions
JM	1994	a 99.7	99.46	0.24			
TT	1990 ^a	8.7	8.5	0.2			
		b	c	e			
	1996	8.6	8.4	0.2			

Table 10.1 (b) - Emissions of Sulphur Dioxide (SO₂) from Energy Activities: 1990, 1994 and 1996

(1000 t)

Country	Year	TOTAL Energy activities	Total fugitive emissions from fuels	Total fuel combustion			
				Energy industries	Manufacturing industries and construction	Transport	Other fuel combustion
JM	1994	99.46	0.61	30.12	63.04	2.10	3.59
TT	1990 ^a	8.5	0.0				
		c	c	c d	d	d	
	1996	8.4	0.0	1.7	0.7	6.0	

AIR2: EMISSIONS OF NITROGEN OXIDES (NO_x)**H****Concept and Definition**

Nitrogen oxides, or NO_x, is the generic term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. Many of the nitrogen oxides are colorless and odorless. However, one common pollutant, nitrogen dioxide (NO₂) along with particles in the air can often be seen as a reddish-brown layer over many urban areas. Nitrogen oxides form when fuel is burned at high temperatures, as in a combustion process. The primary manmade sources of NO_x are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels. NO_x can also be formed naturally.

Nitrogen oxides are indirect greenhouse gases. They have been the target of environmental policies for their role in forming ozone (O₃), as well for their direct acidification effects. Fuel combustion activities are the most significant anthropogenic source of NO_x. Within fuel combustion, the most important sources are the energy industries and mobile sources.

Please refer to AIR2 for definitions of selectable source categories.

Method of Computation

Local authorities perform regular inspections in order to determine the conformity of a number of works and activities with environmental regulations. In this context, NO_x emissions are measured (and regulated, where appropriate) for a number of activities, for example electricity production stations and large industrial installations. For those activities for which measurements are not directly available, it is possible to estimate emissions by considering the amount of fuel consumed (both fossil fuels and biomass) together with emission factors related to particular combustion processes. The total annual amount of nitrogen oxides emissions must be derived for all economic activities, and particularly energy production and transformation, industry, transportation and domestic and tertiary sectors. The unit of measurement is Kt NO_x per year.

Indicator Relevance

The purpose of this indicator is to identify the activities mostly responsible for the release of nitrogen oxides into the atmosphere. Nitrogen oxides emitted into the atmosphere can be transported over large distances and can be deposited at the surface often hundreds or thousands of kilometres away from the site of the source. They are partly responsible for a series of problems, including acidification and increased concentration of photo-oxidants in the atmosphere that result in the occurrence of photochemical smog episodes. Nitrogen oxides are also associated with both respiratory morbidity and mortality in humans.

Data Assessment

All reporting Member States followed the internationally recommended definitions for emissions of Nitrogen oxides. This indicator is, therefore, regionally and internationally conceptually harmonized.

Only three of the reporting eighteen Member States/Associate Members of the Community provided data for this indicator.

Data Sources

In accordance with the decision that the UNSD would provide data on waste, water, land, and air to the CARICOM Secretariat, data for this indicator was collected from the UNSD instead of directly from Member States and Associate Members.

Please refer to **Appendix 1.10.2 (a)** for the original sources of the data, as specified by the UNSD, on air for Member States and Associate Members.

Evaluation

Tables 10.2 (a) and (b) provides data on emissions of *Nitrogen Oxides* (NO_x) for Jamaica, Suriname and Trinidad and Tobago. Suriname's total reported *Nitrogen Oxides* emissions declined by 49 per cent from 1975 to 1999, decreasing from 20.1 thousand tonnes in 1975 to 10.3 thousand tonnes in 1999. Suriname's data also reveals that following an initial drop in emissions by 66 per cent for the five year period 1980 to 1985, emissions increased stealthily towards the end of the period. Data reported for Jamaica in 1994 reveals that road transport contributed to 39 per cent of total emissions from energy activities followed by emissions from manufacturing industries which contributed 35 per cent of total emissions while energy industries and other fuel combustion contributed to 19 per cent and 6 per cent of total emissions respectively. In 1990, Trinidad and Tobago registered total emissions of Nitrogen Oxides at 37.2 thousand tonnes comprising 97 per cent emissions from energy activities.

Table 10.2 (a) - Emissions of Nitrogen Oxides (NO_x): 1975-1999

(1000 t)

Country	Year	TOTAL emissions	TOTAL Energy activities	Industrial processes	Solvent use	Agriculture	Other sources of emissions
JM	1994	a 30.92	30.92				
SR	1975	20.1					
	1980	25.0					
	1985	8.6					
	1990	8.9					
	1995	9.9					
	1998	10.2					
	1999	10.3					
TT	1990 ^a	37.2	36.1	0.1		0.4	0.6
	1996						

Table 10.2 (b) - Emissions of Nitrogen Oxides (NO_x) from Energy Activities: 1975-1999

(1000 t)

Country	Year	TOTAL Energy activities	Total fugitive emissions from fuels	Total fuel combustion			
				Energy industries	Manufacturing industries and construction	Transport	Other fuel combustion
JM	1994	30.92	0.04	5.94	10.83	12.20	1.91
SR	1975						
	1980						
	1985						
	1990						
	1995						
	1998						
	1999						
TT	1990 ^a	36.1	35.1				0.4
	1996			12.9	2.5	25.6	

AIR3: EMISSIONS OF NON-METHANE VOLATILE ORGANIC COMPOUNDS (NM-VOCs)**H****Concept and Definition**

Non-methane volatile organic compounds (NM-VOCs) are a group of solvent-like organic compounds that easily evaporate at normal temperatures. They are produced mainly in fuel combustion and in processes that use solvents or solvent-based products such as painting, metal degreasing etc. Several of these chemicals are harmful to human health if inhaled, ingested, drunk or get in contact with skin. NM-VOCs are significant precursors to ground level ozone formation. NM-VOCs are the sum of all hydrocarbon air pollutants except methane.

Non-methane volatile organic compounds emissions from anthropogenic activities are primarily comprised of total emissions from the use of fuels for energy purposes, evaporative emissions during industrial processes and non-industrial use of organic solvents.

Please refer to AIR2 for definitions of selectable source categories.

Method of Computation

The total annual amount of non-methane volatile organic compounds emissions must be derived for all economic activities, and particularly energy-related activities, industrial processes and non-industrial use of organic solvents. The unit of measurement is Kt of NM-VOCs per year.

Indicator Relevance

The purpose of this indicator is to identify the activities mostly responsible for the release of non-methane volatile organic compounds into the atmosphere. The annual NM-VOCs emissions are directly related to the amount of biomass and fossil fuels used for energy production, the amount of solid and liquid fossil fuels that is produced, transported, distributed and stored, and the quantity of organic solvents used for non-industrial purposes.

Data Assessment

All reporting Member States followed the internationally recommended definitions for emissions of Non-methane volatile organic compounds (NM-VOCs). This indicator is, therefore, regionally and internationally conceptually harmonized.

Only two of the reporting eighteen Member States/Associate Members of the Community provided data for this indicator.

Data Sources

In accordance with the decision that the UNSD would provide data on waste, water, land, and air to the CARICOM Secretariat, data for this indicator was collected from the UNSD instead of directly from Member States and Associate Members.

Please refer to **Appendix 1.10.3 (a)** for the original sources of the data, as specified by the UNSD, on air for Member States and Associate Members.

Evaluation

Data on Emissions of Non-Methane Volatile Organic Compounds (NM-VOCs) for Jamaica and Trinidad and Tobago are provided in **Tables 10.3(a)** and **(b)** below. Estimations for Jamaica for 1994 are presented for *energy activities* and *industrial processes* only and reveal that *transport* contributes to 57 per cent of total emissions followed by *other fuel combustion* activities which contributed to 20 per cent of total emissions. Manufacturing industries and construction contribute to 0.8 per cent of total emissions in this Member State while Energy industries contributed to 0.4 per cent of total emissions of NM-VOCs. Total emissions of NM-VOCs for Trinidad and Tobago in 1996 was estimated at 93.1 thousand tonnes of which energy activities accounted for 66 per cent of emissions while Industrial processes accounted for 34 per cent.

Table 10.3 (a) - Emissions of Non-Methane Volatile Organic Compounds (NM-VOCs): 1990 and 1994

(1000 t)

Country	Year	TOTAL emissions	TOTAL Energy activities	Industrial processes	Solvent use	Agriculture	Other sources of emissions
JM	1994	a 34.89	29.05	5.84			
TT	1990 ^a	93.1	61.1	32.0			

Table 10.3 (b) - Emissions of Non-Methane Volatile Organic Compounds (NM-VOCs) from Energy Activities: 1990 and 1994

(1000 t)

Country	Year	TOTAL Energy activities	Total fugitive emissions from fuels	Total fuel combustion			
				Energy industries	Manufacturing industries and construction	Transport	Other fuel combustion
JM	1994	29.05	1.63	0.15	0.28	20.02	6.97
TT	1990 ^a	61.1	33.2				

AIR4: EMISSIONS OF CARBON DIOXIDE (CO₂)**H****Concept and Definition**

Carbon dioxide (CO₂) is a colourless, odourless and non-poisonous gas formed by combustion of carbon and in the respiration of living organisms and is considered a greenhouse gas.

Carbon dioxide (CO₂) is the most common greenhouse gas produced by anthropogenic activities, accounting for about 60 per cent of the increase in radiative forcing since preindustrial times (IPCC, 1992). By far the largest source of CO₂ emissions is from the oxidation of carbon when fossil fuels are burned, which accounts for 70-90 per cent of total anthropogenic CO₂ emissions. When fuels are burned, most carbon is emitted as CO₂ immediately during the combustion process. Some carbon is released as CO, CH₄, or non-methane hydrocarbons, which oxidise to CO₂ in the atmosphere within a period from a few days to 10-11 years.

United Nations. United Nations Framework Convention on Climate Change (A/AC.237/18 (Part II)/Add.1 and Corr.1). Opened for signature at Rio de Janeiro on 4 June 1992. (Section C)

United Nations. Glossary of Environment Statistics. Series F, No. 67 (United Nations publication, Sales No. E.96.XVII.12).

<http://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1ref1.pdf>

Please refer to AIR2 for definitions of selectable source categories.

Method of Computation

Total anthropogenic carbon dioxide (CO₂) emissions from the sectors energy, industrial processes, solvent and other product use, agriculture, land use change and forestry, and waste. Since CO₂ removals are also accounted for, this indicator concerns net emissions. Natural emissions are not accounted for. The unit of measurement is tonnes CO₂ per year.

Indicator Relevance

The scientific community acknowledges that atmospheric concentrations of CO₂ have continued to increase, and that “the balance of evidence suggests a discernible human influence on global climate”. Future climate change is expected to have major impacts on e.g. agriculture, water resources, ecosystems and human health. The indicator is linked to the indicators of other greenhouse gases. Furthermore, the indicator is linked to those in the area of Ozone Depletion. Ozone is a greenhouse gas, and therefore changes in stratospheric ozone should be considered in assessing climate change. Moreover, greenhouse gases are believed to affect stratospheric ozone depletion. These effects include both positive and negative effects.

Data Assessment

All reporting Member States followed the internationally recommended definitions for emissions of Carbon dioxide (CO₂). This indicator is, therefore, regionally and internationally conceptually harmonized.

Only three of the reporting eighteen Member States/Associate Members of the Community provided data for this indicator with countries reporting data for select categories only.

Data Sources

In accordance with the decision that the UNSD would provide data on waste, water, land, and air to the CARICOM Secretariat, data for this indicator was collected from the UNSD instead of from Member States and Associate Members.

Please refer to **Appendix 1.10.4 (a)** for the original sources of the data, as specified by the UNSD, on air for Member States and Associate Members.

Evaluation

Three CARICOM Member States reported Emissions of Carbon Dioxide (CO₂). Suriname reported data in three year gaps revealing average emissions of 1.9 million tonnes for the period 1981 to 1997. Estimates of CO₂ emissions for Jamaica in 1994 for energy activities and industrial processes only revealed that emissions from energy activities totalled 8.2 million tonnes comprising the combustion of fuels from various activities while Industrial processes totalled 0.4 million tonnes. 50 per cent of emissions caused by the burning of fossil fuels resulted from activities in manufacturing industries and construction while activities in energy industries accounted for 27 per cent. Road transport and other fuel combustion accounted for the remaining 23 per cent. CO₂ emissions for Trinidad and Tobago were reported for 1990, 1996 and 2000. Data for 1990 were reported for energy activities from fuel combustion which totalled 9.9 million tonnes and industrial processes totalling 5.1 million tonnes. In 1996 a figure of 3.7 million tonnes was reported for energy activities within energy industries. Trinidad and Tobago emissions caused by the burning of fossil for the year 2000 was reportedly 11.7 million tonnes of which manufacturing industries and construction accounted for 68 per cent, energy industries accounted for 18 per cent, road transport for 12 per cent and other fuel combustion accounted for the remaining 2 per cent.

Table 10.4 (a) - Emissions of Carbon Dioxide (CO₂): 1981-2000, various years

		(million tonnes)					
Country	Year	TOTAL emissions	TOTAL Energy activities	Industrial processes	Solvent use	Agriculture	Other sources of emissions
JM	1994		8.20	0.38			
SR	1981	2.0					
	1983	1.4					
	1985	1.6					
	1987	1.8					
	1989	1.9					
	1991	2.1					
	1993	2.1					
	1995	2.1					
	1997	2.1					
TT	1990 ^a	15.0	9.9	5.1			
	1996 ^b						
	2000 ^c	11.7 ^d					

Table 10.4 (b) - Emissions of Carbon Dioxide (CO₂): 1981-2000, various years

		(million tonnes)					
Country	Year	TOTAL Energy activities	Total fugitive emissions from fuels	Total fuel combustion			
				Energy industries	Manufacturing industries and construction	Transport	Other fuel combustion
JM	1994	8.20		2.25	4.11	1.26	0.59
SR	1981						
	1983						
	1985						
	1987						
	1989						
	1991						
	1993						
	1995						
	1997						
TT	1990 ^a	9.9		3.7			
	1996 ^b			2.1	8.0	1.4	0.2
	2000 ^c						

AIR5: EMISSIONS OF METHANE (CH₄)**H****Concept and Definition**

This is the total anthropogenic methane (CH₄) emissions from the sectors energy, industrial processes, solvent and other product use, agriculture, land use change and forestry, and waste. Natural emissions are not accounted for in this indicator. The unit of measurement is tonnes CH₄ per year. CH₄ is a powerful greenhouse gas whose levels have already doubled. The main purpose of this indicator is to monitor total anthropogenic CH₄ emissions.

The indicator is linked to the indicators of other greenhouse gases. Furthermore, the indicator is linked with those in the area of Ozone Depletion. CH₄ emissions are believed to affect stratospheric ozone depletion. Moreover, ozone is also a greenhouse gas, and therefore changes in stratospheric ozone should be considered in assessing climate change.

The main sources of CH₄ are agriculture (mainly flooded rice paddies and livestock), waste dumps, coal mining and natural gas production and transportation. CH₄ is besides a direct greenhouse gas also a precursor of tropospheric ozone and stratospheric water vapour.

The *radiative forcing capacity* (RF) is the amount of energy per unit area per unit time, absorbed by the greenhouse gas, that would otherwise be lost to space.

Please refer to AIR2 for definitions of selectable source categories.

Method of Computation

The 1996 “Guidelines for National Greenhouse Gas Inventories” have been formally adopted by the IPCC as the international method to estimate emissions.

Indicator Relevance

Although total CH₄ emissions are relatively small compared with total CO₂ emissions, the radiative forcing capacity of CH₄ is relatively large. Methane, the primary component of natural gas, accounts for 16 percent of all greenhouse-gas emissions resulting from human activities. It is 23 times as effective at trapping heat in the atmosphere as carbon dioxide and has a relatively short atmospheric lifetime of approximately 12 years. This makes methane-emissions reductions particularly effective at mitigating global warming in the near term. Capturing methane emissions and using them as a clean energy source can also increase energy security, enhance economic growth, improve local air quality and industrial safety. <http://www.esrl.noaa.gov/research/themes/forcing/Methane.pdf>

Data Assessment

All reporting Member States followed the internationally recommended definitions for emissions of methane (CH₄). This indicator is, therefore, regionally and internationally conceptually harmonized.

Only Jamaica and Trinidad and Tobago reported data on this indicator of the reporting eighteen Member States/Associate Members of the Community.

Data Sources

In accordance with the decision that the UNSD would provide data on waste, water, land, and air to the CARICOM Secretariat, data for this indicator was collected through the UNSD.

Please refer to **Appendix 1.10.5 (a)** for the original sources of the data, as specified by the UNSD, on air for Member States and Associate Members.

Evaluation

Due to the limited availability of quantitative data, no analysis will be presented.

Table 10.5 (a) - Emissions of Methane (CH₄): 1990 and 1994

(1000 t)

Country	Year	TOTAL emissions	TOTAL Energy activities	Industrial processes	Solvent use	Agriculture	Other sources of emissions
JM	1994		0.68				
TT	1990 ^a	32.75	1.4	0.8		6.3	24.2

Table 10.5 (b) - Emissions of Methane (CH₄): 1990 and 1994

(1000 t)

Country	Year	TOTAL Energy activities	Total fugitive emissions from fuels	Total fuel combustion			
				Energy industries	Manufacturing industries and construction	Transport	Other fuel combustion
JM	1994	0.68	0.02	0.08	0.12	0.39	0.07
TT	1990 ^a	1.4	0.05				

H**AIR6: EMISSIONS OF NITROUS OXIDE (N₂O)****Concept and Definition**

Total anthropogenic nitrous oxide (N₂O) emissions from the sectors energy, industrial processes, solvent and other product use, agriculture, land use change and forestry, and waste. Natural emissions are not accounted for in this indicator. The unit of measurement is tonnes N₂O per year. The indicator is linked to the indicators of other greenhouse gases. Furthermore, the indicator is linked with those in the area of Ozone Depletion. Due to the long lifetime of N₂O, N₂O emissions can reach the stratosphere and affect the destruction of the ozone layer.

Moreover, ozone is also a greenhouse gas, and therefore changes in stratospheric ozone should be considered in assessing climate change. The main sources of anthropogenic N₂O are intensive agriculture using high levels of fertilisers, and a number of industrial processes. Natural sources are poorly quantified, but are probably twice as large as anthropogenic sources. Natural emissions are not accounted for in this indicator.

The *radiative forcing capacity* (RF) is the amount of energy per unit area per unit time, absorbed by the greenhouse gas, that would otherwise be lost to space.

Please refer to AIR2 for definitions of selectable source categories.

Method of Computation

The 1996 “Guidelines for National Greenhouse Gas Inventories” have been formally adopted by the IPCC as the international method to estimate emissions of Nitrous Oxide.

Indicator Relevance

N₂O is one of the major greenhouse gases. The main purpose of this indicator is to monitor total anthropogenic N₂O emissions. Although total N₂O emissions are relatively small in comparison with total CO₂ emissions, the radiative forcing capacity of N₂O is relatively large.

Data Assessment

All reporting Member States followed the internationally recommended definitions for air and emissions of nitrous oxide (N₂O). This indicator is, therefore, regionally and internationally conceptually harmonized.

Jamaica and Trinidad and Tobago were the only member states to provide data on this indicator.

Data Sources

In accordance with the decision that the UNSD would provide data on waste, water, land, and air to the CARICOM Secretariat, data for this indicator was collected through the UNSD.

Please refer to **Appendix 1.10.6 (a)** for the original sources of the data, as specified by the UNSD, on waste of Member States and Associate Members.

Evaluation

Due to the limited availability of quantitative data, no analysis will be presented.

Table 10.6 (a) - Emissions of Nitrous Oxide (N₂O): 1990 and 1994

(1000 t)

Country	Year	TOTAL emissions	TOTAL Energy activities	Industrial processes	Solvent use	Agriculture	Other sources of emissions
JM	1994		0.11	0			
TT	1990 ^a	0.82	0.04			0.7	0.08

Table 10.6 (b) - Emissions of Nitrous Oxide (N₂O): 1990 and 1994

(1000 t)

Country	Year	TOTAL Energy activities	Total fugitive emissions from fuels	Total fuel combustion			
				Energy industries	Manufacturing industries and construction	Transport	Other fuel combustion
JM	1994	0.11	0	0.02	0.03	0.01	0.05
TT	1990 ^a	0.04					

AIR7: TOTAL EMISSIONS OF LEAD (Pb) AND CONSUMPTION OF LEADED PETROL**H****Concept and Definition**

Total consumption of gasoline and diesel oil by all categories of road vehicles i.e. passenger vehicles, light duty vehicles, trucks, lorries, buses and motorcycles, must be recorded on an annual basis. The unit of measurement is Kt of gasoline and diesel oil per year. The quantity of petroleum products consumed for road transportation is directly related to the vehicle ownership rate and gives an indication of the driving habits as well as the economic evolution for any country. As an observation, it can be noted that public transport means are used to a larger extent in the developing than in the developed countries around the world.

Measurement

Total amounts of gasoline and diesel oil used for road transportation are readily available from local as well as regional and international organisations (e.g. IEA, EUROSTAT). These fuel quantities have to be disaggregated into specific amounts for each vehicle category. This can be achieved by considering the composition of the vehicles fleet (categories must be identified by age and technology used) and specific consumption rates. Further information must also be selected referring to driving patterns and specifically to the mileage for the transportation of both persons and goods within the boundaries of the country.

Indicator Relevance

The road transportation sector is one of the major contributors of emissions of air pollutants in the atmosphere, such as NO_x, NMVOC (combustion and fugitive emissions), CO₂ and other compounds. The main purpose of this indicator is to monitor the amount of emissions of lead due to its potential and proven carcinogenic effect.

In the last few years, it has become apparent that present consumption patterns can not be sustained in the long term. Recently, the automobile industry in collaboration with local governments - under a series of (voluntary) agreements - has taken a number of steps towards the improvement of fuel efficiency of all new road vehicles in the market. Furthermore, fuel switching is also currently being promoted with the use of liquefied petroleum gas and natural gas as alternative fuels for buses and/or passenger vehicles.

Data Assessment

All reporting Member States followed the internationally recommended definitions for the consumption of leaded petrol. This indicator is, therefore, regionally and internationally conceptually harmonized.

Jamaica and Trinidad and Tobago were the only member states to provide data on this indicator.

Data Sources

In accordance with the decision that the UNSD would provide data on waste, water, land, and air to the CARICOM Secretariat, data for this indicator was collected from the UNSD instead of from Member States and Associate Members.

Please refer to **Appendix 1.10.7 (a)** for the original sources of the data, as specified by the UNSD, on air of Member States and Associate Members.

Evaluation

Jamaica's total consumption of leaded petrol declined for the period 1995 to 2001 more so from 1997 whilst its consumption of lead-free petrol increased for the same period. This is as a result Jamaica's policy to phase out leaded petrol on the island since 1997. This caused an initial 17 per cent decline in consumption of lead petrol from 1997 to 1998 and a 31 per cent increase in the consumption of lead-free petrol. Trinidad and Tobago's emissions of lead from mobile sources totalled 0.05 thousand tonnes while emissions of lead from stationary sources totalled 0.02 thousand tonnes in 1996.

Table 10.7 - Emissions of Lead (Pb) and Consumption of Leaded Petrol: 1995-2002

(1000 barrels and 1000 t)

Country	Year	Total mobile sources	Total stationary sources	Total emissions	Total consumption of leaded petrol	Total consumption of lead-free petrol
JM	1995	...	...	...	1862.2	1150.6
	1996	...	...	...	1982.1	1578.3
	1997	...	...	...	1901.2	1828.3
	1998	...	...	...	1581.8	2397.0
	1999	...	...	...	1296.8	2793.0
	2000	...	...	...	374.0	3790.5
	2001	...	...	...	4.8	4162.8
	2002 ^p	...	...	...	0.0	4523.3
TT	1996 ^a	0.05	0.02	0.07		

Addendum

Air emissions predominantly arise from the combustion of fossil fuels, mainly from transport activities, power plants, refineries and other kinds of fuel combustion activities. These activities generate a large variety of air pollutants of which carbon dioxide (CO₂), sulphur dioxide (SO₂), nitrogen oxides (NO_x) and non-methane volatile organic compounds (NM-VOCs) are among the most significant ones. Industrial processes and agriculture also contribute to the emissions of the above-mentioned pollutants as well as to emissions of other greenhouse gases such as nitrous oxide (N₂O) and methane (CH₄). Transport and the metal industry are the main sources of lead (Pb) emissions. Transport and energy production facilities are furthermore the main factors affecting ambient air quality in cities.

DEFINITIONS

Total emissions refer to Emissions from human activities in the country. Please note that emissions from international aviation and maritime transport are excluded.

Energy activities [Production and Use] comprise all emissions related to the production and use of energy in any sectors of the economy and households. It includes emissions from fuel combustion as well as fugitive fuels. This variable corresponds to IPCC category 1.

Fuel combustion: Emissions caused by the burning of fossil fuels in any process. It comprises the combustion of fuels in the energy industries, all other industries and transport; it includes small combustion activities such as in commercial, institutional or residential buildings, fuel combustion in agriculture and in all other activities. CO₂ emission from the combustion of biomass is excluded. This variable corresponds to IPCC category 1A.

Energy industries: Emissions from fuel combustion in public electricity and heat production, in petroleum refining, manufacturing of solid fuels and other energy industries. For the purposes of this questionnaire, fugitive emissions from fuels (coal mining, oil and gas fields, venting and flaring etc.) are not allocated to this category. Please note that evaporative emissions from vehicles are included under Transport. This variable corresponds to IPCC category 1A1.

Manufacturing industries and construction: Emissions from fuel combustion in manufacturing industries (except coke ovens that are allocated under Energy industries) and construction. If more disaggregated data by industrial activities according to International Standard Industrial Classification of All Economic Activities (ISIC)/Revision 3 are available, please provide them in the Supplementary Information Sheet. This variable corresponds to IPCC category 1A2.

Transport: Emissions from fuel combustion in transport activities such as domestic air transport, road transport, railways, navigation and other transport. Evaporative emissions from vehicles are also included in this category. Please note that emissions from international aviation and marine transport are excluded. If separate data on emissions from road transport are available, please provide them in the Supplementary Information Sheet. This variable corresponds to IPCC category 1A3.

Other fuel combustion: Emissions from fuel combustion in commercial, institutional and residential buildings, agriculture, forestry, fishing and other non-specified fuel combustion (e.g. military). The fishing sector includes domestic inland, coastal and deep-sea fishing. This variable corresponds to the sum of the IPCC categories 1A4 and 1A5.

Fugitive emissions from fuels: Intentional or unintentional releases of gases from anthropogenic activities. In particular, they may arise from the production, processing, transmission, storage and use of fuels, and include emissions from combustion only where it does not support a productive activity (e.g., flaring of natural gases at oil and gas production facilities). The variable corresponds to the sum of the IPCC categories 1B1 and 1B2.

Industrial processes: Emissions from processes such as chemical industry, metal industry, production and use of mineral products and other industries. If more disaggregated data according to ISIC/Rev.3 are available, please provide them in the Supplementary Information Sheet. This variable corresponds to IPCC category 2.

Solvent use: Emissions from paint application, degreasing and dry cleaning, manufacturing and processing of chemical products, and other processes using solvents and other solvent based products. This variable corresponds to IPCC category 3.

Agriculture: Emissions from the breeding of livestock, rice cultivation, field burning of agricultural residues, prescribed burning of savannas and other agricultural activities. This variable corresponds to IPCC category 4.

Other sources of Emissions: Emissions from waste water treatment, waste disposal on land, waste incineration, land-use changes, forestry and other activities which have not been covered above. This variable corresponds to the sum of the IPCC categories 5, 6 and 7.

Non-methane volatile organic compounds (NM-VOCs): A group of solvent-like organic compounds that easily evaporate at normal temperatures. They are produced mainly in fuel combustion and in processes that use solvents or solvent-based products such as painting, metal degreasing etc. Several of these chemicals are harmful to human health if inhaled, ingested, drunk or get in contact with skin. NM-VOCs are significant precursors to ground level ozone formation. NM-VOCs are the sum of all hydrocarbon air pollutants except methane.

Appendix 1.10

1.10.1 (a): Sources of Data for Tables 10.1 (a) and (b) - Emissions of Sulphur Dioxide (SO₂): 1990, 1994 and 1996

Country	Data Source
JAMAICA	Statistical Institute of Jamaica
TRINIDAD AND TOBAGO	EMA (Environmental Management Authority)

1.10.2 (b): Notes for Tables 10.1 (a) and (b) - Emissions of Sulphur Dioxide (SO₂): 1990, 1994 and 1996

Country	Notes
JAMAICA	a - Energy activities and industrial processes only
TRINIDAD AND TOBAGO	a - Source: EMA (2001). Initial National Communication of the Republic of Trinidad and Tobago under the UNFCCC b - Refers to emissions from fuel combustion in energy industries, industry, and transport, plus industrial processes. c - Refers to emissions from fuel combustion in energy industries, industry, and transport only d - Partial estimates delivered using the WHO Rapid Assessment Methodology e - UNSD: Estimate

1.10.2 (a): Sources of Data for Tables 10.2 (a) and (b) - Emissions of Nitrogen Oxides (NO_x): 1975 - 1999

Country	Data Source
JAMAICA	Statistical Institute of Jamaica
TRINIDAD AND TOBAGO	EMA (Environmental Management Authority)

1.10.2 (b): Notes for Tables 10.2 (a) and (b) - Emissions of Nitrogen Oxides (NO_x): 1975 - 1999

Country	Notes
JAMAICA	a - Energy activities only
TRINIDAD AND TOBAGO	Estimates derived from applying the waste load factor from the WHO manual. Municipal waste figures are the annual estimated figures for the three waste sites managed by SWMCOL.

1.10.3 (a): Sources of Data for Tables 10.3 (a) and (b) - Emissions of Non-Methane Volatile Organic Compounds (NM-VOCs): 1990 and 1994

Country	Data Source
JAMAICA	Statistical Institute of Jamaica
TRINIDAD AND TOBAGO	EMA (Environmental Management Authority)

1.10.3 (b): Notes for Tables 10.3 (a) and (b) - Emissions of Non-Methane Volatile Organic Compounds (NM-VOCs): 1990 and 1994

Country	Notes
JAMAICA	a - Energy activities and industrial processes only
TRINIDAD AND TOBAGO	Source: EMA (2001). Initial National Communication of the Republic of Trinidad and Tobago under the UNFCCC

1.10.4 (a): Sources of Data for Tables 10.4 (a) and (b) - Emissions of Carbon Dioxide (CO₂): 1981-2000, various years

Country	Data Source
JAMAICA	Statistical Institute of Jamaica
TRINIDAD AND TOBAGO	EMA (Environmental Management Authority)

1.10.4 (b): Notes for Tables 10.4 (a) and (b) - Emissions of Carbon Dioxide (CO₂): 1981-2000, various years

Country	Notes
TRINIDAD AND TOBAGO	a - Source: EMA (2001). Initial National Communication of the Republic of Trinidad and Tobago under the UNFCCC b - Partial estimate delivered using the WHO Rapid Assessment Methodology - Source: UNDP/EMA (1998) Pollutant Inventory Study for Trinidad & Tobago c - Source: 2003 Edition CO ₂ Emissions From Fuel Combustion 1971-2001, IEA Statistics d - Emissions from fuel combustion only

1.10.5 (a): Sources of Data for Tables 10.5 (a) and (b) - Emissions of Methane (CH₄): 1990 and 1994

Country	Data Source
JAMAICA	Statistical Institute of Jamaica
TRINIDAD AND TOBAGO	EMA (Environmental Management Authority)

1.10.5 (b): Notes for Tables 10.5 (a) and (b) - Emissions of Methane (CH₄): 1990 and 1994

Country	Notes
TRINIDAD AND TOBAGO	a - Source: EMA (2001). Initial National Communication of the Republic of Trinidad and Tobago under the UNFCCC

1.10.6 (a): Sources of Data for Tables 10.6 (a) and (b) - Emissions of Nitrous Oxide (N₂O): 1990 and 1994

Country	Data Source
JAMAICA	Statistical Institute of Jamaica
TRINIDAD AND TOBAGO	EMA (Environmental Management Authority)

1.10.6 (b): Notes for Tables 10.6 (a) and (b) - Emissions of Nitrous Oxide (N₂O): 1990 and 1994

Country	Notes
JAMAICA	p - preliminary data
TRINIDAD AND TOBAGO	Source: EMA (2001). Initial National Communication of the Republic of Trinidad and Tobago under the UNFCCC

1.10.7 (a): Sources of Data for Table 10.7 - Emissions of Lead (Pb) and Consumption of Leaded Petrol: 1995 - 2002

Country	Data Source
JAMAICA	Statistical Institute of Jamaica
TRINIDAD AND TOBAGO	EMA (Environmental Management Authority)

1.10.7 (b): Notes for Table 10.7 - Emissions of Lead (Pb) and Consumption of Leaded Petrol: 1995 - 2002

Country	Notes
JAMAICA	p - preliminary data
TRINIDAD AND TOBAGO	a - Partial estimates delivered using the WHO Rapid Assessment Methodology - Source: UNDP/EMA (1998) Pollutant Inventory Study for Trinidad and Tobago

WS1: GENERATION OF WASTE BY TYPE AND SECTOR**H****Concept and Definition**

Waste refers to materials that are not prime products (i.e. products produced for the market) for which the generator has no further use for his own purpose of production, transformation or consumption, and which he discards, or intends or is required to discard. It excludes residuals directly recycled or reused at the place of generation (i.e. establishment) and waste materials that are directly discharged into ambient water or air.

Sector Classifications:

Agriculture and Forestry comprise the activities of growing crops, raising animals, harvesting timber, and harvesting other plants and animals from a farm or their natural habitats.

Mining and quarrying include the extraction of minerals occurring naturally as solids (coal and ores), liquids (petroleum) or gases (natural gas). Extraction can be achieved by underground or surface mining or well operation.

Manufacturing comprises units engaged in the physical or chemical transformation of materials, substances, or components into new products. The materials, substances, or components transformed are raw materials that are products of agriculture, forestry, fishing, mining or quarrying, as well as products of other manufacturing activities.

Energy production includes electricity, gas, steam and hot water supply, which cover the activity of providing electric power, natural gas, and steam supply through a permanent infrastructure (network) of lines, mains and pipes.

Construction includes general construction and special trade construction for buildings and civil engineering, building installation and building completion. It includes new work, repair, additions and alterations, the erection of prefabricated buildings or structures on the site and also construction of a temporary nature.

Waste by Type and Sector:

Waste from *Agriculture and Forestry* is all waste from agricultural and forestry activities. Manure used as fertilizer should not be included; only 'surplus' (or excess) manure should be included.

Industrial waste refers to waste from mining and quarrying, manufacturing industries, energy production and construction.

- Waste from *mining and quarrying* refers to all waste from mining and quarrying activities.

- Waste from *manufacturing industries* refers to all waste from manufacturing industries.
- Waste from *energy production* refers to all waste from electricity, gas, steam and hot water supply.
- Waste from *construction* refers to all waste from construction.

Municipal waste includes household waste and similar waste. Municipal waste also includes bulky waste (e.g. white goods, old furniture, mattresses) and yard waste, leaves, grass clippings, street sweepings, the content of litter containers, and market cleansing waste, if it is managed as waste. Waste originating from households, commerce and trade, small businesses, office buildings and institutions (schools, hospitals, government buildings) is also referred to as municipal waste. On the other hand, waste from municipal sewage network and treatment and municipal construction and demolition waste are not referred to as municipal waste.

Other refers to waste generated from all other economic activities not so far specified.

(Please refer to the *United Nations Environment Statistics 2006 Questionnaire* at http://unstats.un.org/unsd/environment/Questionnaires/q2006_waste_english.pdf.)

Method of Computation

The generation of waste by type and sector was compiled from questionnaires distributed to Member States/Associate Members through a UNSD/UNEP/CARICOM collaboration according to the categories mentioned above.

Indicator Relevance

Generation of waste is intimately linked to the level of economic activity in a particular country. It is also an indication of the patterns of consumption of raw materials. A reduction in the volume of waste generated is an indication of changes in consumption patterns with respect to raw materials and of an increase in recycling and reuse. Moreover, data on waste generation over several years can indicate the level of progress the country has made toward waste reduction efforts. It can also indicate potential improvements in process efficiency and productivity.

In the case of industrial wastes, the generation of waste by type and sector provides a measure of the extent and type of industrialization in a country. The two major concerns in relation to the generation of mining waste are the large volumes that are produced as well as the potential for hazardous substances to be present in the waste stream. Large areas of land are used for depositing mining waste and this activity has the potential to cause environmental pollution if not properly controlled. Construction activity is seen as a key indicator of growth and prosperity. Due to the very large volume of construction and demolition waste produced, it can use up valuable space in landfills. In addition, if

not separated at the source it can contain small amounts of hazardous waste. However, it also has a high resource value and the technology for the separation and recovery of construction and demolition waste is well established, readily accessible and, in general, inexpensive. Most importantly, there is a reuse market for aggregates derived from construction and demolition waste in roads, drainage and other construction projects.

Data Assessment

All reporting Member States followed the internationally recommended definitions for waste and types of wastes. This indicator is, therefore, regionally and internationally conceptually harmonized.

Only nine of the reporting eighteen Member States/Associate Members of the Community provided data for this indicator and the data provided was not detailed, perhaps due to the fact that environment statistics is new to the Region.

Data Sources

In accordance with the decision that the UNSD would provide data on waste, water, land, and air to the CARICOM Secretariat, data for this indicator was collected from the UNSD instead of from Member States and Associate Members.

Please refer to **Appendix 1.11.1 (a)** for the original sources of the data, as specified by the UNSD, on waste for Member States and Associate Members.

Evaluation

Generation of Waste by Type and Sector is presented below in **Table 11.1**. The data shows that in 2005, Antigua and Barbuda reported that waste generated by *other activities* was the largest source of waste generated at 38,220 tonnes or 45.5 per cent of Total waste generated by all sources followed by *Industrial activities* with 14,450 tonnes or 29.2 per cent of Total waste generated and *Municipal waste* with 21,250 tonnes (25.3 per cent) of waste generated for the year. Antigua and Barbuda also reported that *Manufacturing industries* and *Construction* contributed to 14,450 tonnes and 10,050 tonnes, respectively, of waste generated by *Industrial activities* in for the year 2005.

Data on waste generation by *Total Industrial activities* reported by Belize for the period 1995 to 2003 shows an increase in the total waste generated from 434,018 tonnes in 1995 to 530,839 tonnes in 2003. The largest amount of waste generated by *Total Industrial activities* was seen in 2002 at 533,236 tonnes for this Member State. Data was also reported for *Municipal waste* generated for the years 1997 (38,100 tonnes) and 2000 (62,100 tonnes). Total waste generated in 1995 for Guyana was reported at 42,665 tonnes and this increased by 5 per cent to 44,831 tonnes in 1996 and a further by 2.4 per cent in 1997 followed by another increase of 2.4 per cent in 1998. The most significant increase

in Total waste generated in Guyana was from 1999 to 2000 where the waste generation increased from 47,287 tonnes to 57,256 tonnes, representing an increase of 21.1 per cent.

Estimates of Jamaica's waste generated by selected *Industrial activities* were reported for the year 1995 and actual Municipal waste generated. The data shows that Mining and quarrying generated a significant amount of waste at 14,000,000 tonnes as compared to Manufacturing industries, Construction and Agriculture and forestry activities which generated 76,000 tonnes, 50 tonnes and 17 tonnes of waste respectively. Municipal waste generated for Jamaica in 1995 was reported at 597,000 tonnes.

St. Vincent and the Grenadines reported waste generation by total *Industrial activities* at 2,500 tonnes in 2002 of which *Construction activities* contributed 1,900 tonnes. *Municipal waste* for St. Vincent and the Grenadines was reported at 37,800 tonnes in 2002 and *Total waste generation* was 42,500 tonnes.

Data for Trinidad and Tobago showed a large increase in waste generation in the *Agriculture and forestry* sector from 17,514 tonnes in 1995 to 91,118 tonnes in 1996. Waste generated by the *Energy production* sector was also reported in 1997 and stood at 27,100 tonnes.

Associate Member Anguilla reported data for the period 2001 to 2005 on *Total waste generation*. *Total waste generation* for this Island declined at the beginning of the period from 5,635 tonnes in 2001 to 5,395 tonnes in 2002 and further to 5,143 tonnes in 2003 followed by an increase in 2004 to 5,963 tonnes and a greater increase by 36.4 percent to 8,131 tonnes in 2005. Data on *Municipal waste* also revealed a similar trend, declining during the period 2000 to 2003 from 4,358 tonnes to 4,244 tonnes and further to 4,051 tonnes and increasing by the end of the period 2004 (4,695 tonnes) and 2005 (5,283 tonnes). Data for Bermuda for the years 1999 to 2001 on *Total waste generation* reveals an increase from 1999 where 66,500 tonnes was generated to 68,700 tonnes in 2000 declining by 1.5 per cent to 67,500 tonnes in 2001.

Table 11.1 Generation of Waste by Type and Sector: 1990, 1995 - 2005

Country	Year	Agriculture and forestry	Industrial activities				TOTAL	Other activities	Municipal waste	Tonnes
			Mining and quarrying	Manufacturing industries	Energy production	Construction				Total waste generation
AG	2005	0		14,450		10,050	24,500	38,220	38,220	83,970
BZ	1995	...	...	...	...	434,018	...	...	...	...
	1996	...	...	...	...	454,897	...	...	...	...
	1997	...	...	...	...	524,021	...	38,100 ^A	...	...
	1998	...	...	...	...	524,976	...	...	...	...
	1999	...	...	...	...	515,557	...	...	...	...
	2000	...	...	...	...	516,459	...	62,100	...	...
	2001	...	...	...	...	496,783	...	...	...	...
	2002	...	...	...	...	533,236	...	...	...	...
	2003	...	...	...	...	530,839	...	...	...	...
GY	1995	...	...	...	...	...	...	...	...	42,665
	1996	...	...	...	...	...	...	...	...	44,831
	1997	...	...	...	...	...	...	...	...	45,890
	1998	...	...	...	...	...	...	...	...	47,008
	1999	...	...	...	...	...	...	...	...	47,287
	2000	...	...	...	...	...	...	...	...	57,256
JM	1995	17,000 ^A	14,000,000 ^A	76,000 ^A	...	50,000 ^A	...	...	597,000	n/a
VC	2002	...	...	...	...	1,900	2,500	...	...	42,500
TT	1995	17,514 ¹	...	...	...	...	...	...	...	...
	1996	91,118 ¹	...	...	...	...	...	...	...	...
	1997	...	...	...	27,100 ¹	...	...	...	...	...
ASSOCIATE MEMBERS										
AI	2001	650	...	...	...	...	626	0	0	5,635
	2002	612	...	...	...	...	538	0	0	5,395
	2003	551	...	...	...	...	541	0	0	5,143
	2004	744	...	...	...	...	524	0	0	5,963
	2005	1,625	...	...	...	...	1,223	0	0	8,131
BM	1999	...	...	...	...	...	...	66,500	66,500	66,500
	2000	...	...	...	...	...	...	68,700	68,700	68,700
	2001	...	...	...	...	...	...	67,500	67,500	67,500

WA2: TREATMENT AND DISPOSAL OF MUNICIPAL AND HAZARDOUS WASTE BY TYPE OF METHOD**H****Concept and Definition**

Municipal waste includes household waste and similar waste. Municipal waste also includes bulky waste (e.g. white goods, old furniture, mattresses) and yard waste, leaves, grass clippings, street sweepings, the content of litter containers, and market cleansing waste, if it is managed as waste. Waste originating from households, commerce and trade, small businesses, office buildings and institutions (schools, hospitals, government buildings) is also referred to as municipal waste. On the other hand, waste from municipal sewage network and treatment and municipal construction and demolition waste are not referred to as municipal waste.

Hazardous wastes are wastes or a combination of wastes, which because of its concentration, quantity or physical, chemical or infectious distinctiveness may *inter alia*: (a) cause or significantly contribute to an increase in mortality or increase in serious irreversible or incapacitating illness; or (b) pose a substantial present or potential threat to human health, or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

Types of Treatment and Disposal of Waste:

Recycled waste is any waste that goes through the recycling process. Recycling is defined as any reintroduction of waste material in a production process that diverts it from the waste stream, except reuse as fuel. Both reprocessing as the same type of product and for different purposes should be included. Recycling within industrial plants, that is, at the place of generation, should be excluded.

Composting is a biological process that submits biodegradable waste to anaerobic or aerobic decomposition and that results in a product that is recovered.

Incineration is the controlled combustion of waste with or without energy recovery.

Landfilled waste includes all waste going to landfills, either directly or after sorting and/or treatment, as well as residues from recovery and disposal operations going to landfills. Landfill is the final placement of waste into or onto the land in a controlled or uncontrolled way. The definition covers both landfill in internal sites (that is, where a generator of waste is carrying out its own waste disposal at the place of generation) and in external sites.

Other waste treatment/disposal refers to any other final treatment or disposal different from recycling (composting), incineration and landfill. Permanent storage of waste is included here.

Method of Computation

Data for this indicator were compiled from questionnaires distributed to Member States/Associate Members through a UNSD/UNEP/CARICOM collaboration according to the categories mentioned above.

Indicator Relevance

Although hazardous waste represents a small percentage of all waste generated in the Caribbean, it can present a potential risk to both human health and the environment. Hazardous waste is typically the subject of special legislation and requires special management arrangements to ensure that it is kept separate from and treated differently to non-hazardous waste. The main purpose of the hazardous component of this indicator, therefore, is to represent the amount of hazardous waste having special and controlled treatment. The indicator would provide a measure of the development of the hazardous waste management system, and thereby the actions taken to diminish the threats to human health and the environment.

Different disposal methods have different impacts on the environment and on human health. The breakdown of waste treatment and disposal provided by this indicator gives an indication of the possible environmental impacts by identifying the types of treatment and disposal methods most widely used in the Region. For example, there are numerous potential impacts associated with the landfilling of waste, including the production of leachate and landfill gas, odours, flies, vermin and the use of land. Data showing the amount of waste landfilled will give an indication of the probability of these negative affects occurring and the extent to which they may occur so that preventative actions can be taken.

Data Assessment

This indicator, treatment and disposal of municipal and hazardous waste by type of method, is regionally and internationally conceptually harmonized since all reporting Member States followed the internationally recommended definitions for municipal waste, hazardous waste, and methods of treatment and disposal of municipal and hazardous wastes.

Only seven Member States and two Associate Members of the usual fourteen reporting Member States and four reporting Associate Members provided data for this indicator. The data provided was not detailed, perhaps due to the fact that environment statistics is new to the Region.

Data Sources

In accordance with the decision that the UNSD would provide data on waste, water, land, and air to the CARICOM Secretariat, data for this indicator was collected from the UNSD instead of from Member States and Associate Members.

Please refer to **Appendix 1.11.2 (a)** for the original sources of the data, as specified by the UNSD, on waste of Member States and Associate Members.

Evaluation

Data on the Treatment and Disposal of *Municipal* and *Hazardous Waste* by type and method are presented for six Member States in **Table 1.2** below. The data reveals that a total of 21,250 tonnes of *Municipal waste* was disposed of in Antigua and Barbuda in the year 2005 using Landfill. Belize also reported data on *Municipal waste* and *Hazardous waste* for the years 1997 and 2000. The data reported reveals an overall increase in the amount of *Municipal waste* handled from 38,100 tonnes in 1997 to 62,100 tonnes in 2000 representing an increase of 63 per cent. The data reported on *Hazardous waste* disposed of by *Incineration* also saw an increase from 691 tonnes to 775 tonnes, an increase of 12. per cent. Dominica reported 20,906 tonnes of *Municipal waste* for the period 2001 to 2001 disposed of by Landfill and 627 tonnes of *Hazardous waste* collected in 2002 disposed of by *Landfill*. During 1995 to 2000, *Municipal waste* in Guyana increased from 60 million tonnes in 1995 to 81 million tonnes in 2000, with steady increases throughout the period and was disposed of mainly by *Landfill*. Data was also reported for Guyana in 2001 and 2002 and revealed an increase in the management of *Municipal waste* from 81,426 tonnes in 2001 to 87,765 tonnes in 2002 representing an increase of 7.8 per cent.

In 2001 Jamaica reported 718,000 tonnes of *Municipal waste* which were disposed of by *Landfill*. Jamaica also reported on 10,000 tonnes of *Hazardous waste* managed in 1998. St. Vincent and the Grenadines reported data for the year 2002 which show that 37,800 tonnes of *Municipal waste* was collected of which 32,100 tonnes or 85 per cent were disposed of by *Landfill* and 5,700 tonnes were *Recycled/ composted*. *Hazardous waste* generated in 2002 for St. Vincent and the Grenadines was 0.15 tonnes and this was disposed of by *Landfill*.

Data for Trinidad and Tobago in **Table 11.2** shows a gradual increase in the total *Municipal waste* collected for the years 1990, 1995 to 1997 and 1999 to 2002. The overall increase in *Municipal waste* collected for the reporting period was 98 per cent from 214,880 tonnes in 1990 to 424,984 tonnes in 2002. Among reporting Associate Members Anguilla and The British Virgin Islands, The British Virgin Islands collected and managed the most *Municipal waste* with an average 26,698 tonnes of waste collected and managed during the period 1995 to 2005. The data reveals a significant increase in *Municipal waste* from 1995 (11,165 tonnes) to 1999 (25,698 tonnes) by 130 per cent and from 2000 (28,560 tonnes) to 2001 (29,861 tonnes) declining in 2002 by 16 per cent and further in 2003 by 5 per cent, increasing thereafter in 2004 to 33,033 tonnes and finally to 36,697 tonnes in 2005. After 1995, more than 70 per cent of *Municipal waste* collected in The British Virgin Islands was *incinerated* and the remaining disposed of by *Landfill* up from 39 per cent in 1995. Anguilla reported data for the period 2001 to 2005 which *Municipal waste* collections declining at the beginning of the period from 4,358 tonnes in 2001 to 4,244 tonnes in 2002 and further to 4,051 tonnes in 2003 and increasing towards the end of the period from 4,695 tonnes in 2004 to 4,283 tonnes in 2005. The overall increase in *Municipal waste* collections was 21 per cent all of which were disposed of by *Landfill*.

Table 11.2: Treatment and Disposal of Municipal and Hazardous Waste by type and method: 1990, 1995 - 1997, 1999 - 2005

		(Tonnes)									
Country	Year	Municipal waste					Hazardous waste				
		Recycled	Incinerated	Landfilled	Other	Total	Recycled	Incinerated	Landfilled	Other	Total
AG	2005			21,250		21,250	...	...	...	...	...
BZ	1997			38,100		38,100	...	...	...	...	...
	1999	...	...	...	...	...	...	691	...	...	691
	2000			62,100		62,100	...	775	...	...	775
DM	2001			20,906		20,906	...	...	...	...	...
	2002			20,906		20,906	...	...	502	...	627
	2003			20,906		20,906	...	...	...	...	...
	2004			20,906		20,906	...	...	...	...	...
	2005			20,906		20,906	...	...	...	...	...
GY	1995	368	1,320	60,418	...	...	...	...	...	...	...
	1996	372	1,152	63,500	...	...	...	...	...	...	...
	1997	429	1,200	65,000	...	...	...	...	...	...	...
	1998	483	1,272	66,514	...	...	...	...	...	...	...
	1999	504	1,338	67,051	...	...	...	...	...	...	...
	2000	536	1,285	81,100	...	...	...	...	...	...	...
	2001	...	...	...	...	81,426	...	...	...	...	...
	2002	...	...	...	...	87,765	...	...	...	...	...
JM	1998	...	...	...	...	...	...	...	...	...	10,000*
	2001			718,000		718,000	...	...	...	...	...
VC	2002	5,700	0	32,100	0	37,800	0.00	0.00	0.15	0.00	0.15

Table 11.2 Cont'd. Treatment and Disposal of Municipal and Hazardous Waste by type and method: 1990, 1995 - 1997, 1999 - 2005

Country	Year	Municipal waste					Hazardous waste				
		Recycled	Incinerated	Landfilled	Other	Total	Recycled	Incinerated	Landfilled	Other	Total
TT	1990	...	...	...	...	214,880	...	...	...	...	...
	1995	...	...	...	...	247,170	...	...	...	...	...
	1996	...	...	...	...	259,000	...	...	...	...	...
	1997	...	...	...	...	296,000	...	...	...	...	...
	1999	...	...	...	...	335,984	...	...	...	...	...
	2000	...	...	...	...	423,742	...	...	...	...	...
	2001	...	...	...	...	378,784	...	...	...	...	...
	2002	...	...	...	...	424,984	...	...	...	...	...
ASSOCIATE MEMBERS											
AI	2001			4,358		4,358	...	...	...	...	...
	2002			4,244		4,244	...	...	...	...	...
	2003			4,051		4,051	...	...	...	...	...
	2004			4,695		4,695	...	...	...	...	...
	2005			5,283		5,283	...	...	...	...	...
VG	1995		4,409		6,756	11,165	...	...	...	...	...
	1999		18,618		7,080	25,698	...	...	...	...	...
	2000		21,731		6,829	28,560	...	...	...	...	...
	2001		22,461		7,400	29,861	...	...	...	...	...
	2002		20,481		4,455	24,936	...	...	...	...	...
	2003		18,712		4,918	23,630	...	...	...	...	...
	2004		26,506		6,527	33,033	...	...	...	...	...
	2005		29,452		7,245	36,697	...	...	...	...	...

Addendum

Waste is still a new area of environment within the Region. As such, very little detailed quantitative data is available for dissemination and evaluation. Please see below, however, a précis of the waste data that Member States and Associate Members do have available.

Barbados:

Landfilling is the main form of solid waste disposal in Barbados. A survey in 1993 by Stanley Associates found that in any seven day period, 265 tonnes of municipal solid waste were produced at the Mangrove Pond landfill site. Another study has estimated that 130,000 tonnes of waste per capita was generated in 1996. In 1998, 316 derelict vehicles and 7,140 loads of bulky waste were collected for disposal. In addition, 1.44 million gallons of sewage were generated in 1992.

In 1996, 737 tonnes of hazardous waste moved through the Port Authority. Of the 737 tonnes, 43.4 per cent was liquid or solid compounds with the potential to generate acids, alkalis, solvents, pesticides, heavy metals, inks and dyes. The Integrated Solid Waste Management Programme manages hazardous waste in Barbados.

Barbados encounters difficulties in assessing and managing the growing volumes of waste generated by the public and the thousands of tourists that flock the island yearly. These difficulties are evident in the increasing occurrences of littering and illegal dumping. There is also a lack of an integrated approach to collection and disposal of solid and special waste and there is the need for organisational change and a cost recovery mechanism. (*Please refer to the Government of Barbados: State of the Environment Report 2000 pgs 81-85.*)

Belize:

Belize regards solid waste as waste generated by households and the commercial, industrial and construction sectors. Solid waste comprises most of the waste that is disposed of at landfills, dumpsites and incineration plants. The Belize Solid Waste Management Project conducted a study which estimated that the average waste generation rate was 2.1 pounds per person per day, with approximately 40000 tonnes of municipal solid waste being generated per annum.

In 1997, \$2.6 million Belize dollars per annum (an average of \$22.50 per capita) was spent on municipal waste disposal. Of the total expenditure, 48 per cent was spent on solid waste in Belize City because 51 per cent of the solid waste generated in the country originates there. However, even though Belize City generates more waste than any other city in Belize, San Pedro Town has the highest per capita expenditure on solid waste (\$35.00 per capita).

Belize, like many of the other Caribbean countries, is assessing the available and economically viable means available to them to better dispose of the growing amounts of waste that are being generated. Some of these waste disposal means include composting, landfilling, recycling and incineration. Exporting solid waste, as is already done to Mexico, is also being considered since it is a useful way to get rid of waste and increase the export value in the country.

It should be noted that 60 per cent of the municipal waste generated in Belize is organic waste. As such, if it is properly disposed of, it will be taken care of by the natural processes of decomposition. (*Please refer to the Environmental Statistics for Belize 2000 pgs 53-56.*)

Grenada:

Approximately 100 tonnes of solid waste is generated daily in Grenada. The waste is collected and disposed of at Perseverance in St. George's. The waste collection system covers about 95 per cent of the island. All of the biomedical waste produced is incinerated on the compounds where they are generated or are collected for incineration at the general hospital.

There are two sewage systems on the island that serve 3 per cent of the population. These systems discharge sewage 500 feet into the ocean but the risk of coastal pollution is minimal due to ocean currents that carry outfall effluents away from the land. (*Please refer to Grenada Environmental Statistics pg. 24.*)

Jamaica:

The amount of waste generated in Jamaica is increasing with new technological advancements and consumption patterns. However, like all the Caribbean countries, managing the waste that is generated is a major problem in Jamaica. This manifests itself in the illegal dumping of waste in gullies, rivers and open lots and excessive amounts of littering. In addition, most of the waste disposal sites present in Jamaica are dumps without sanitary treatment, and sewage treatment facilities can only deal with 50 per cent of the sewage produced on the island. It should be noted, however, that the municipal waste collection and disposal system has been rationalized and the National Solid Waste Management Authority formed to reduce the occurrence of these practices.

The recycling and reuse of waste is being practiced on a small scale as means to treat and dispose of waste. These treatment and disposal methods are expected to increase over time as more waste exchange programmes are implemented.

In 1996, 597,000 tonnes of collectable waste (waste that is not burnt, deposited on empty lots or thrown into gullies) was generated. It was estimated then that each Jamaican generates 0.6-0.8 kg of solid waste per day. In 1999, waste generation increased to 945,000 tonnes. (*Please refer to the Jamaica Environment 2001: Environment Statistics and State of the Environment Report pgs 10-15.*)

Saint Lucia:

The Saint Lucia Solid Waste Management Authority is responsible for the management of solid waste in Saint Lucia. There are currently two disposal sites in Saint Lucia: the Ciceron Waste Disposal Site and the Vieux Fort Solid Waste Disposal Site. The Ciceron Site is soon to be closed and the Vieux Fort Disposal Site upgraded. A modern disposal site that complies with international standards will be built to replace the Ciceron Site.

The total volume of waste generated in 1998 was 202,045.5 m³. In 1999, the total volume was 259,884 m³; in 2000, 298,488 m³ and in 2001, the total volume of waste generated was 275,906 m³. Preliminary census results show that 88.4 per cent of households use the garbage trucks/skip as the main method of garbage disposal, followed by burning which is used by 5.1 per cent of households and dumping which accounts for the remaining 1.8 per cent of waste disposal. *(Please refer to the Saint Lucia Compendium of Environmental Statistics 2001 pgs 77-78.)*

Suriname:

The amount of waste generated is increasing with technological developments, new consumption patterns and increasing populations. A significant problem in Suriname is the poor waste disposal and uncontrolled disposal of waste in rivers, gullies and open spaces. The insufficient management of the waste produced is a very serious threat to human health and the environment. *(Please refer to Suriname's Environmental Statistics pgs. 30-31.)*

Appendix 1.11 Sources of Waste Data

1.11.1 (a): Sources of Data for Table 11.1 - Generation of Waste by Type and Sector: 1990, 1995 - 2005

Country	Data Source
ANTIGUA AND BARBUDA	National Solid Waste Management Authority
BELIZE	Land Information Centre
GUYANA	Bureau of Statistics
JAMAICA	Statistical Institute of Jamaica
ST VINCENT AND THE GRENADINES	Central Water and Sewerage Authority
TRINIDAD AND TOBAGO	UNDP/EMA (1998) Pollutant Inventory Study for Trinidad and Tobago
ANGUILLA	Anguilla Statistics Department
BERMUDA	Department of Statistics

1.11.1 (b): Notes for Table 11.1 - Generation of Waste by Type and Sector: 1990, 1995 - 2005

Country	Notes
ANTIGUA AND BARBUDA	Data refer to Antigua only. Manufacturing industries reflect the amalgamation of industrial, commercial and institutional waste. Construction reflects the amalgamation of construction and demolition waste. Other includes inter alia medical wastes, ship generated wastes, sewage, street sweepings, bulk wastes and tires.
BELIZE	Industrial Activities = waste generated from sugar, citrus and shrimp industries. Total waste generated is estimated using per capita from urban areas * population A - Includes waste from urban areas only (residential and commercial)
GUYANA	Generated waste does not include construction and demolition waste, etc., while disposal figures may include such waste.
JAMAICA	* means estimate.
TRINIDAD AND TOBAGO	1 For Agriculture and Forestry Waste, estimates derived from applying the waste load factor from the WHO manual

1.11.2 (a): Sources of Data for Table 11.2 - Treatment and Disposal of Municipal and Hazardous Waste by Type of Method: 1990, 1995 – 1997, 1999 - 2005

Country	Data Source
ANTIGUA & BARBUDA	National Solid Waste Management Authority
BELIZE	Land Information Centre
DOMINICA	Environmental Co-ordinating Council
GUYANA	Mayor and City Council, UNEP
JAMAICA	Statistical Institute of Jamaica
ST VINCENT AND THE GRENADINES	Central Water and Sewerage Authority
TRINIDAD AND TOBAGO	Solid Waste Management Company Limited (SWMCOL)
ANGUILLA	Anguilla Statistics Department
BRITISH VIRGIN ISLANDS	National Statistics Office

1.11.2 (b): Notes for Table 11.2 - Treatment and Disposal of Municipal and Hazardous Waste by Type of Method: 1990, 1995 – 1997, 1999 - 2005

Country	Notes
ANTIGUA AND BARBUDA	Data refer to Antigua only.
BELIZE	Hazardous waste is waste from hospitals only. Information of municipal waste managed was obtained from municipal collection agencies. 1999: SOURCE: ECLAC, REDESA Environmental Statistics & Indicators Database (BADEIMA)
DOMINICA	All information is derived from a Characterization Study carried out in 2002. No recorded data on solid waste management existed before that time. It must however be noted that even some of this information is a best estimate from projections made in a Consultant's Report in 1995. The Dominica Solid Waste Management Corporation now has a weighbridge and hopes to provide more accurate data in the coming years.
JAMAICA	A means estimate n/a Not Available
TRINIDAD AND TOBAGO	Data are from Trinidad and Tobago Solid Waste Management Company Limited (SWMCOL). The landfills managed by SWMCOL collect 85% of solid waste.
BRITISH VIRGIN ISLANDS	Incineration values refer to main island of Tortola only. Other refers to dump site.

WT1: RENEWABLE FRESH WATER RESOURCES**H****Concept and Definition**

Renewable freshwater (surface and groundwater) resources are replenished by precipitation (less evapotranspiration) falling over the territory of the country that ends up as runoff to rivers and recharge to aquifers (internal flow), and by surface waters and groundwater flowing in from other countries (inflow). Climatic, ecological, economic and other limitations to the availability of these resources for abstraction are reflected in the variable "regular freshwater resources at 95 percent of the time". The data shown in the table are usually based on hydrological/meteorological monitoring and modelling.

Sector Classifications:

Precipitation - Total volume of atmospheric wet precipitation (rain, snow, hail, dew, etc.) falling on the territory of the country over one year, in millions of cubic meters (mio m³).

Actual evapotranspiration - Total actual volume of evaporation from the ground, wetlands and natural water bodies and transpiration of plants. According to the definition of this concept in Hydrology, the evapotranspiration generated by all human interventions is excluded, except unirrigated agriculture and forestry. The 'actual evapotranspiration' is calculated using different types of mathematical models, ranging from very simple algorithms (Budyko, Turn Pyke, etc.) to schemes that represent the hydrological cycle in detail.

Internal flow - Total volume of river run-off and groundwater generated over the period of a year, in natural conditions, exclusively by precipitation into a territory. The internal flow is equal to precipitation less actual evapotranspiration and can be calculated or measured. If the river run-off and groundwater generation are measured separately, transfers between surface and groundwater should be netted out to avoid double counting.

Inflow of surface and groundwaters - Total volume of actual external inflow of rivers and groundwater, coming from neighboring countries. Boundary waters should be divided 50/50 between the two riparian countries, unless other water sharing agreements exist.

Renewable freshwater resources = Internal flow + Actual External Inflow of surface and groundwaters

Outflow of surface and groundwaters - Actual outflow of rivers and groundwater into neighboring countries and/or into the sea

Regular freshwater resources 95% of the time - Portion of the total freshwater resource that can be depended on for annual water development during 19 out of 20 consecutive years, or at least 95 percent of the years included in longer consecutive periods. This item yields information about the average annual long-term availability of freshwater for use in human activities.

Freshwater use refers to the quantity of freshwater that is actually used in a year by end users including water delivered by the water supply industry (ISIC 41), water directly abstracted for own use and water received from other parties. Excludes freshwater returned without use.

Renewable groundwater available for annual abstraction - Recharge less the long term annual average rate of flow required to achieve ecological quality objectives for associated surface water. It takes account of the ecological restrictions imposed to groundwater exploitability; other restrictions based on economic and technical criteria could also be taken into account in terms of accessibility, productivity and maximum production cost deemed acceptable by developers. The theoretical maximum of groundwater available is the recharge.

UNSD/UNEP 2001 and 2004 questionnaires on Environment statistics, Water section

Method of Computation

Renewable Freshwater Resources was compiled from questionnaires distributed to Member States/Associate Members through a UNSD/UNEP/CARICOM collaboration according to the categories mentioned above.

Indicator Relevance

This indicator yields information about the average annual long-term availability of fresh water for use in human activities, which is important information for future planning and early warning for any scarcity of water in future. It also helps in taking the proper decision in water management.

Data Assessment

All reporting Member States followed the internationally recommended definitions for water and types of water. This indicator is, therefore, regionally and internationally conceptually harmonized.

Only two of the reporting eighteen Member States/Associate Members of the Community provided data for this indicator and the data provided were not detailed, perhaps due to the fact that environment statistics is still relatively new to the Region.

Data Sources

In accordance with the decision that the UNSD would provide data on waste, water, land, and air to the CARICOM Secretariat, data for this indicator was collected from the UNSD instead of directly from Member States and Associate Members.

Please refer to **Appendix 1.12.1 (a)** for the original sources of the data, as specified by the UNSD, on water for Member States and Associate Members.

Evaluation

Data is presented in **Table 12.1** below for Jamaica and Trinidad and Tobago. *Precipitation* for Jamaica in 1990 was 21,212 million cubic meters and water loss due to *actual evapotranspiration* (Total actual volume of evaporation from the ground, wetlands and natural water bodies and transpiration of plants) was 11,945 million cubic meters resulting in 9,267 million cubic meters of total renewable fresh water resources. *Outflow of surface and ground waters* was reported at 5,576 million cubic meters while *Renewable groundwater available for annual abstraction* was 3,418 million cubic meters and *regular freshwater resources 95% of the time* for Jamaica in 1990 was reported at 665 million cubic meters.

Data for Trinidad and Tobago during the period, 1998 to 2002 revealed fluctuations in the *Inflow of surface and groundwaters*. *Internal flow* or the total volume of river run-off and groundwater generated was reported at 6,662 million cubic meters in 1998 and this declined to 5,780 million cubic meters in 1999 followed by an increase of 13.6 per cent in 2000 to 6,565 million cubic meters after which another decline followed in 2001 to 3,085 million cubic meters and an increase of 70.7 per cent in 2002.

Table 12.1 Renewable Fresh Water Resources: 1990, 1998 - 2002

Country	Year	Precipitation (1)	Actual evapotranspiration (2)	Internal flow (3)=(1)-(2)	Actual external Inflow of surface and ground waters (4)	Total renewable fresh water resources (5)=(3+4)	Outflow of surface and ground waters	(mio m ³ /y)	
								Renewable groundwater available for annual abstraction	Regular freshwater resources 95% of the time
JM	1990	21,212	11,945	9,267	0	9,267	5,576	3,418	665
	TT								
	1998	12,060	5,398	6,662	n/a	6662	n/a		
	1999	11,085	5,305	5,780	n/a	5780	n/a		
	2000	11,449	4,884	6,565	n/a	6565	n/a		
	2001	8,729	5,644	3,085	n/a	3085	n/a		
	2002	10,164	4,898	5,266	n/a	5266	n/a		

WT2: WATER ABSTRACTION BY SOURCE: 1990, 1995 - 2005**H****Concept and Definition**

Water abstraction is water removed from any source, either permanently or temporarily, during a specified period of time. It can be unsustainable if it exceeds the renewal of the resource. In addition, issues relating to the quality of water when it eventually returns to streams, rivers and lakes, are also of concern. Water used for cleaning, cooling and irrigation carries with it soluble salts, chemicals, soil particles and biological wastes, which could deteriorate the quality of the water. Given the already limited groundwater supply in most of the Member States of the CARICOM region, the resource should be properly managed and over-abstraction avoided.

The total volume of freshwater available for use is composed of *water abstracted from fresh (surface and ground) water resources* of the country, of water originating from other sources, such as imports of bulk water from other countries or desalinated water from non-fresh water resources, and the reuse of treated waste water (reclaimed water). Water that is returned without use (e.g. mine water) and water exported in bulk to another country are not considered to be available for use and are therefore subtracted from the total. Abstraction of freshwater is broken down by main water abstractor sectors/activities, according to the International Standard Industrial Classification of All Economic Activities, Third Revision (ISIC Rev.3). Please note that water abstracted directly from the atmosphere into storage tanks is not accounted for.

Definitions used in the collection of the indicator:

Fresh surface water is water which flows over, or rests on the surface of a land mass, natural watercourses such as rivers, streams, brooks, lakes, etc., as well as artificial watercourses such as irrigation, industrial and navigation canals, drainage systems and artificial reservoirs. Water abstracted through bank filtration is included under fresh surface water. Sea-water, and transitional waters, such as brackish swamps, lagoons and estuarine areas are considered non-fresh water and are not included here.

Fresh ground water is water which is being held in, and can usually be recovered from, or via, an underground formation. All permanent and temporary deposits of water, both artificially charged and naturally occurring in the subsoil, of sufficient quality for at least seasonal use are included. This category includes phreatic water-bearing strata, as well as deep strata under pressure or not, contained in porous or fractured soils. Ground water includes springs, both concentrated and diffused, which may be subaqueous.

Total water abstraction refers to water removed from any source, either permanently or temporarily, during a specified period of time. Mine water and drainage water are included. Water abstractions from ground water resources in any given time period are defined as the difference between the total amount of water withdrawn from aquifers and the total amount charged artificially or injected into aquifers. The amounts of water artificially charged or injected are attributed to abstractions from that water resource from which they were originally withdrawn. Water used for hydroelectricity generation is an in-situ use and should be excluded.

Gross freshwater abstracted is the total of fresh surface water and fresh groundwater abstractions over one year within the national territory.

Water returned without use refers to water abstracted from any fresh water source and discharged into fresh waters without use, or before use. Occurs primarily during mining and construction activities. Discharges to the sea are excluded.

Imports of water refer to the total volume of bulk fresh water that is imported from other countries as a commodity through pipelines or on ships. Bottled water is excluded.

Exports of water is the total volume of bulk fresh water that is exported to other countries as a commodity through pipelines or on ships. Bottled water is excluded.

Desalinated water is the total volume of water obtained from desalination processes. (From seawater, brackish water etc.)

Reused water is fresh water that has undergone waste water treatment and is deliverable to a user as reclaimed waste water. This means the direct supply of treated effluent to the user. Excluded is waste water discharged into a watercourse and used again downstream. Recycling within industrial sites is excluded.

Total freshwater made available for use = Gross freshwater abstracted - Water returned without use + Imports of water - Exports of water + Desalinated water + Reused water

Non-fresh water abstraction includes sea water and transitional water, such as brackish swamps, lagoons and estuarine areas.

UNSD/UNEP 2001 and 2004 questionnaires on Environment statistics, Water section

Method of Computation

Data for this indicator were compiled from questionnaires distributed to Member States/Associate Members through a UNSD/UNEP/CARICOM collaboration according to the categories mentioned above. Water abstraction is measured in millions of cubic meters (m³) per year.

Indicator Relevance

This indicator measures the overall pressure on the fresh water resources, providing the proportion of water abstracted for all the economic sectors in relation to water resources. It gives an indication of the vulnerability of a country to water shortages and assesses the need for supply /demand adjustments in water management policies.

(<http://www.un.org/esa/sustdev/sdissues/consumption/cpp1224m11.htm>)

Data Assessment

All reporting Member States followed the internationally recommended definitions for the indicator water extraction by source and as such it is regionally and internationally conceptually harmonized.

Only a total of fourteen Member States and Associate Members, four Member States provided data for this indicator.

Data Sources

In accordance with the decision that the UNSD would provide data on waste, water, land, and air to the CARICOM Secretariat, data for this indicator was collected from the UNSD instead of directly from Member States and Associate Members.

Please refer to **Appendix 1.12.2 (a)** for the original sources of the data, as specified by the UNSD, on waste of Member States and Associate Members.

Evaluation

Water Abstraction by Source for reporting Member States is presented in **Table 12.2** below for Belize, Jamaica, St. Vincent and the Grenadines and Trinidad and Tobago. The data on *Total fresh surface water* abstracted for Belize for the period 1995 to 2000 revealed an overall decline from 1,933 million gallons in 1995 to 1,903 in 2000 a decline of 2 per cent. *Total fresh ground water* abstracted for Belize however, revealed an overall increase for the same period of 14 per cent from 323 million gallons in 1995 to 368 million gallons in 2000. *Total gross fresh water abstraction* for this Member State which represents *Total of fresh surface water* and *fresh groundwater* abstractions increased overall by a minimal 1 per cent with declines reported in 1996 (2,225 million gallons), 1997 (2,184 million gallons) and 1999 (2,224 million gallons) and increases in 1998 (2,249 million gallons) and 2000 (2,270 million gallons) from 1995 (2,256 million gallons). Desalinated water for Belize during the reporting period averaged 49.8 million gallons and increased overall from 1995 (27.1 million gallons) to 2000 (84.7 million gallons). *Total freshwater made available for use* for Belize increased overall by 3.2 per cent.

Jamaica reported *Total gross fresh water abstraction* for the years 1990, 1999 and projected data for 2000. In 1990, *total gross fresh water abstraction* of 913 million cubic meters was reported consisting 63 million cubic meters of *fresh surface water* and 950

million cubic meters of *fresh ground water* and in 1999 *total gross fresh water abstraction* of 300 million cubic meters was reported consisting 114 million cubic meters of *fresh surface water* and 186 million cubic meters of *fresh ground water* a decline of 613 million cubic meters. In 2000, Jamaica projected *Total gross fresh water abstraction* at 1,437 million cubic meters. In 1995, of the total fresh surface water abstracted, 75 per cent was by *Agriculture, fishing and forestry activities* and 7 per cent by *Manufacturing industries*, 1 per cent by *Economic activities* and 17 per cent by *Households* and in 1996 280 million cubic meters of *total fresh surface water abstracted* was by Households.

St. Vincent and the Grenadines reported data on *fresh surface water* abstracted for 1990 and 1995 to 2003 and *Total gross fresh water abstraction* for 1990 and 1995 to 2000. *Total gross fresh water abstraction* increased by 21 per cent during the period 1990 (7.1 million cubic meters) to 2000 (8.5 million cubic meters) in this Member State.

During the period 1999 to 2002, of the *Gross fresh surface water abstracted* in Trinidad and Tobago a greater per cent was abstracted for *Manufacturing industries activities* (60 per cent in 1999, 55 per cent in 2000, 95 per cent in 2001 and 68 per cent in 2002) than for *Agriculture, forestry and fishing activities* (40 per cent in 1999, 45 per cent in 2000, 5 per cent in 2001 and 32 per cent in 2002). This trend was also seen in data reported on for *Gross fresh groundwater abstracted* when *Manufacturing industries* activities abstracted an average of 94 per cent during the period 1999 to 2002. In 2003, all reported *total fresh surface water abstracted* (0.1 million cubic meters) and *Gross fresh groundwater abstraction* (3.0 million cubic meters) were for *Agriculture, forestry and fishing activities*.

Table 12.2 Water Abstraction by Source: 1990, 1995 - 2005

(mio m³/y)

Country	Year	Fresh surface water abstracted (1)						Total
		by:						
		Public supply (ISIC 41)	Agriculture, fishing and forestry (ISIC 01-05)	Manufacturing industries (ISIC 15-37)	Production of electricity (ISIC 40)	Other economic activities	Households	
BZ	1995							1932.7
	1996							1895.1
	1997							1846.1
	1998							1913.7
	1999							1889.4
	2000							1902.8
JM	1990							63
	1995		75%	7%		1%	17%	
	1996						280	
	1999							114
	2000 ^A							
VC	1990*							7.1
	1995*							7.4
	1996							7.7
	1997							7.7
	1998							7.8
	1999							8.5
	2000							8.5
	2001							8.4
	2002							8.9
	2003							8.8
TT	1999		5.6	8.4	n/a			14.0
	2000		6.6	8.2	n/a			14.8
	2001		0.3	5.6	n/a			5.9
	2002		4.2	9.0	n/a			13.2
	2003		0.1		n/a			0.1

Table 12.2 Cont'd. Water Abstraction by Source: 1990, 1995 - 2005

Country	Year	Fresh ground water abstracted (2)						Total
		by:						
		Public supply (ISIC 41)	Agriculture, fishing and forestry (ISIC 01-05)	Manufacturing industries (ISIC 15-37)	Production of electricity (ISIC 40)	Other economic activities	Households	
BZ	1995							322.9
	1996							329.8
	1997							337.8
	1998							335.6
	1999							334.2
	2000							367.5
JM	1990							850
	1995							
	1996							
	1999							186
	2000 ^A							
VC	1990							
	1995							
	1996							
	1997							
	1998							
	1999							
	2000							
	2001							
	2002							
	2003							
TT	1999		0.3	8.3	n/a			8.6
	2000		0.3	10.0	n/a			10.3
	2001		1.1	9.0	n/a			10.1
	2002		0.4	7.9	n/a			8.3
	2003		3.0	-	n/a			3.0

Table 12.2 Cont'd. Water Abstraction by Source: 1990, 1995 - 2005

Country	Year	Total gross fresh water abstraction (3)=(1)+(2)	Water returned without use (4)	Net freshwater abstracted (=3-4)	Imports of water (5)	Exports of water (6)	Desalinated water (7)	Reused water (8)	Total freshwater made available for use (9)=(3)-(4)+(5)-(6)+(7)+(8)	Leakage during transport
BZ	1995	2255.6					27.1		2282.7	
	1996	2224.9					28.7		2253.6	
	1997	2183.9					45.0		2228.9	
	1998	2249.3					52.4		2301.7	
	1999	2223.6					60.8		2284.4	
	2000	2270.3					84.7		2355.0	
JM	1990	913			0	0	0			
	1995									
	1996									
	1999	300								
	2000 ^A	1,437								
VC	1990 ^A	7.1								
	1995 ^A	7.4								
	1996 ^A	7.7								
	1997 ^A	7.7				0.02				
	1998 ^A	7.8				0.02				
	1999 ^A	8.5								
	2000 ^A	8.5								
	2001									
	2002									
	2003									
TT	1999	22.6								
	2000	25.1								
	2001	16.0								
	2002	21.5								
	2003	3.1								

WT3: WATER USE BY SUPPLY CATEGORY AND ACTIVITIES H

Concept and Definition

Total water supply is the volume of water supplied for final use, either as public water supply (by economic units belonging to ISIC 41), as self supply (where the abstractor is also the end user), or as other supply (where the abstractor supplies the water to a different end user). Public water supply is broken down by main groups of activities to which the water is supplied according to ISIC rev.3.

The *use* of water is wide and includes many economic activities, such as agriculture and forestry, fishing, manufacturing, hotels and restaurants, as well as households, and for recreation. It is important to know the breakdown of water use according to these different economic activities and households to determine how best to design policies for water resources management. Growing populations, as well as increased economic activities, have caused an increase in the demand for water resources. In the CARICOM region, the tourism industry is a major user of water and sustainable tourism policies and practices can be designed to monitor water use.

Water Supply Category and Activities

Water abstraction by water supply industry is water supplied by economic units engaged in collection, purification and distribution of water (including desalting of sea water to produce water as the principal product of interest, and excluding system operation for agricultural purposes and treatment of waste water solely in order to prevent pollution.) It corresponds to ISIC division 41. Deliveries of water from one public supply undertaking to another are excluded.

Irrigation water refers to water which is applied to soils in order to increase their moisture content and to provide for normal plant growth.

Self-supply is the abstraction of water for one's own final use including water drawn from village wells.

Other supply refers to any supply of water not specified elsewhere in particular, supplies from commercial and industrial establishments, whether marketed or not. This definition also includes the supply of reusable water.

Water losses during transport is the volume of water lost during transport between a point of abstraction and a point of use, and between points of use and reuse.

Total water supply refers to the delivery of water to users and abstraction for one's own final use. Total water supply excludes water used in hydropower generation. (Total public water supply + Self-supply + Other supply)

UNSD/UNEP 2001 and 2004 questionnaires on Environment statistics, Water section

Method of Computation

Water Use by Supply Category and Activities was obtained from questionnaires distributed to Member States/Associate Members through a UNSD/UNEP/CARICOM collaboration according to the categories mentioned above.

Indicator Relevance

Water is a resource essential to life. A sustainable use of water has to ensure a balance between abstraction and natural rate of recharge, in the long-term and a high level of environmental protection and a secure supply of high quality water for human consumption and economic purposes.

In many areas, groundwater abstraction exceeds recharging rates and the aquifer becomes overexploited. The consequent depletion of underground water resources can have a negative impact on biodiversity and the concerned aquatic ecosystems. At the same time, an unsustainable use of water undermines the basis for further economic development. Water demand varies considerably between regions, depending on natural conditions, economic and demographic structures. Water use for industry and domestic consumption are considerably higher in the developed countries than in the developing ones. In developing countries, water use for agriculture is the main consuming sector and water consumption for domestic purposes is increasing, particularly in newly urbanised agglomerations. (<http://www.un.org/esa/sustdev/sdissues/consumption/cpp1224m11.htm>)

Data Assessment

Three Member States provided data on Water Use by Supply Category and Activities and all countries followed the internationally recommended definition for this indicator. This indicator is, therefore, harmonized.

Data Sources

In accordance with the decision that the UNSD would provide data on waste, water, land, and air to the CARICOM Secretariat, data for this indicator was collected from the UNSD instead of from Member States and Associate Members.

Please refer to **Appendix 1.12.3 (a)** for the original sources of the data, as specified by the UNSD, on water of Member States and Associate Members.

Evaluation

Data on Water Use by Supply Category and Activities is presented in **Table 12.3** below for Belize, Jamaica and Trinidad and Tobago. For the period 1995 to 2000, *Total water supply* in Belize averaged 1,082

millions of cubic meters per year with *water losses during transport* averaging 1,202 millions of cubic meters per year.

Total public water supply for Jamaica was 300.45 millions of cubic meters in 1999, and increased significantly to 42,866 millions of cubic meters in 2000 falling slightly to 41,855 millions of cubic meters in 2001. *Total water supply including self-supply and other sources of supply* was reported at 913 millions of cubic meters in 1990 and was estimated to be 1,437 millions of cubic meters in 2000. In 1996, 85 per cent of Jamaica's population was connected to public water supply.

Trinidad and Tobago's *total public water supply* for the period 1999 to 2002 averaged 302 millions of cubic meters of which *Manufacturing industries* were supplied an average of 32 millions of cubic meters of water and *Agriculture, forestry, fishing activities* 5 millions of cubic meters. *Public water supply to households* averaged 140 millions of cubic meters for the period and *Water losses during transport* averaged 216 millions of cubic meters. In 1999, 70 per cent of the population was connected to public water supply and at the end of the period 67 per cent of the population was connected to public water supply.

Table 12.3 Water Use by Supply Category and Activities: 1990, 1995 - 2005

Country	Year	Total public water supply (ISIC 41) (1)					H/holds	Self-supply (2)	Other supply (3)	Total water supply (4)= (1)+(2)+(3)	Water losses during transport *	Net freshwater delivered by water supply industry (ISIC 41) (=1-2) (=6+7+8+9+10)	Population connected to public water supply	Population supplied by water supply industry (ISIC 41)
		Economic activities				Total								
		Agriculture, forestry, fishing (ISIC 01-05)	Manufacturing industries (ISIC 15-37)	Production and distribution of electricity (ISIC 40)	Other economic activities									
BZ	1995								929	1,353				
	1996								919	1,335				
	1997								1,035	1,194				
	1998								1,129	1,173				
	1999								1,181	1,104				
	2000								1,301	1,055				
JM	1990								913			85		
	1996													
	1999					300								
	2000					42,866								
	2001					41,855			1,437 ^A					
TT	1999	5	31	n/k	n/k	286	134	n/k	n/k	n/k	208	70	70	
	2000	5	31	n/k	n/k	298	138	n/k	n/k	n/k	213	69	69	
	2001	5	32	n/k	n/k	291	142	n/k	n/k	n/k	219	68	68	
	2002	5	32	n/k	n/k	332	146	n/k	n/k	n/k	223	67	67	

WT4: WASTE WATER GENERATION**H****Concept and Definition**

Total waste water generated is the quantity of water in cubic meters (m³) that is discharged due to being of no further immediate value to the purpose for which it was used or in the pursuit of which it was produced because of its quality, quantity or time of occurrence.

Method of Computation

Waste Water Generation was obtained from questionnaires distributed to Member States/Associate Members through a UNSD/UNEP/CARICOM collaboration according to the categories mentioned above.

Indicator Relevance

The amount of *waste water generated* is linked to the amount of water used. For industries and households, the major part of the water used (except water that is contained in the product or otherwise irretrievable, water that is lost due to leakage, and evaporation) is returned to the environment as (treated or non-treated) waste water. The table asks for the estimated volume of waste water according to its origin (main economic activities defined by ISIC rev.3, and households), regardless to its pollutant content, its pathways and its destination.

Using water more effectively reduces both the need for high quality water and the amount of wastewater generated. Reducing the water sent to onsite wastewater treatment systems may improve the overall process performance by reducing the hydraulic loading and, in some cases, providing a more stable wastewater flow.

The choice to use water more efficiently reduces water needs and wastewater generation. An important first step to water conservation is to realize how much water various activities use.

Data Assessment

Of the eighteen Member States and Associate Members that usually report data, Trinidad and Tobago was the only country that provided data for this indicator. Data was provided on Household waste water generated only.

Trinidad and Tobago followed the internationally recommended definition on wastewater generated by households. This indicator is, therefore, harmonized.

Data Sources

In accordance with the decision that the UNSD would provide data on waste, water, land, and air to the CARICOM Secretariat, data for this indicator was collected from the UNSD.

Please refer to **Appendix 1.12.4 (a)** for the original sources of the data, as specified by the UNSD, on water of Member States and Associate Members.

Evaluation

Table 12.4 below presents data for Trinidad and Tobago for the period 1995 to 2002 on total waste water generated by Households. The data shows that there was an overall decline of 6.3 per cent in total waste water generated by Households from 1995 when 95 million cubic meters was reported to 2002 when 89 million cubic meters of waste water was generated.

Table 12.4: Waste Water Generation: 1995 - 2002

		(1000 m ³ /d)						
Country	Year	Total waste water generated						
		Agriculture, forestry and fishing (ISIC 01-05)	Mining and quarrying (ISIC 10-14)	Manufacturing Industries (ISIC 15-37)	Production and distribution of electricity (ISIC 40)	Construction (ISIC 45)	Other economic activities	Households
TT	1995							95,192
	1996							83,259
	1997							72,019
	1998							83,490
	1999							81,745
	2000							80,000
	2001							84,596
	2002							89,183

WT5: WASTE WATER TREATMENT FACILITIES**H****Concept and Definition**

The share of the resident population connected to public/urban waste water collecting system, to public/urban waste water treatment and to independent treatment facilities indicate the coverage and level of sanitation. The table also asks for the number and design capacity of waste water treatment plants according to the provided level of treatment to understand the infrastructure available for waste water treatment.

Waste water collection and treatment is often concentrated in urban settlements. The table includes selected variables on water supply and waste water treatment at city level.

Wastewater can be discharged directly into water bodies, or may be treated to remove some of the pollutants before being discharged. This table asks for details (number, design capacity) of the wastewater treatment infrastructure serving the population of the country, and covers urban treatment stations serving a larger population as well as independent treatment stations for a small number of households. The amount and type of pollutants removed will depend on the technical specifications of the wastewater treatment plant.

Waste Water Treatment Facilities

Population connected to waste water collecting system is the percentage/number of the resident population connected to the public waste water collecting systems (sewerage). Public waste water collecting systems may deliver waste water to treatment plants or may discharge it without treatment to the environment.

Population connected to waste water treatment is the percentage/number of the resident population whose waste water is treated at public waste water treatment plants.

Population connected to independent treatment (septic tanks) is the percentage of resident population whose waste water is treated in individual, often private facilities such as septic tanks.

Waste water treated in public treatment plants refers to all treatment of waste water in municipal treatment plants by official authorities, or by private companies for local authorities, whose main purpose is waste water treatment.

Biological treatment refers to processes which employ aerobic or anaerobic micro-organisms and result in decanted effluents and separated sludge containing microbial mass together with pollutants. Biological treatment processes are also used in combination and/or in conjunction with mechanical and advanced unit operations. To avoid double counting, water subjected to more than one type of treatment should be reported under the highest level of treatment only.

Method of Computation

Waste Water Treatment Facilities was obtained from questionnaires distributed to Member States/Associate Members through a UNSD/UNEP/CARICOM collaboration according to the categories mentioned above.

Indicator Relevance

Waste water is a major problem in many countries, especially in developing countries, because of a lack of wastewater treatment facilities or unaffordable technologies. There are three main types of waste water treatment, mechanical which facilitates the sedimentation of the coarsest particles, biological which enables the decomposition of biological matter contained in wastewater, and advanced which enables the removal of water-soluble nutrients and heavy metals.

Data Assessment

Of the eighteen Member States and Associate Members that usually report data, Belize, Dominica and Trinidad and Tobago were the only countries that provided data for this indicator. This may be due to the fact that environment statistics is new to Region.

Data Sources

In accordance with the decision that the UNSD would provide data on waste, water, land, and air to the CARICOM Secretariat, data for this indicator was collected from the UNSD.

Please refer to **Appendix 1.12.5 (a)** for the original sources of the data, as specified by the UNSD, on water of Member States and Associate Members.

Evaluation

Table 12.5 below shows data on Waste Water Treatment Facilities for two Member States Belize and Trinidad and Tobago. Data for Belize shows that in 1991 15.8 per cent of the population was connected to the waste water collecting system and this declined slightly to 15.1 per cent in 2000. The data on the percentage of the Population in Belize connected to waste water treatment declining slightly from 16 per cent in 1991 to 15 per cent in 2000. 19 per cent of the Population was connected to independent treatment (septic tanks) facilities as compared to 35 per cent in 2000 representing an increase of 16 per cent..

Available information for Trinidad and Tobago shows that the total Population connected to a waste water collecting system and waste water treatment facility was 233,283 in 2002.

Table 12.5: Waste Water Treatment Facilities: 1990-1991, 1995 - 2002

Country	Year	Population connected to waste water collecting system	Population connected to waste water treatment	Population connected to waste water collecting system	Population connected to waste water treatment	Population connected to independent treatment (septic tanks)	Waste water treatment plants		Design capacity of waste water treatment plants of which: Biological treatment 1000 m ³ /d
		% of pop.	% of pop.	Number	Number	% of pop.	of which: Biological treatment Number	Total Number	
BZ	1991	15.8	15.8			18.7		4	
	2000	15.1	15.1			34.7		6	
TT	1990*						12		
	1995*						12		95,192
	1996						12		83,259
	1997						12		72,019
	1998						12		83,490
	1999						12		81,745
	2000						12		80,000
	2001						12		84,596
2002			233,283	233,283		12		89,183	

WT6: WATER QUALITY OF SELECTED RIVERS**H****Concept and Definition**

Information was collected on the water quality of selected rivers, lakes and coastal areas as measured at selected measuring stations. The tables include the most frequently measured parameters of ambient water quality, for which the annual mean concentrations are to be reported, accompanied by information on the selected water body and measuring station. The selection of the water bodies should be based on their national (economic, demographic, geographic, hydrologic) importance and on the quantity and quality of available measurements. The selection of the measuring station should be based on the availability of longer time series of measurements.

Water Quality

Biochemical Oxygen Demand (BOD₅) is the amount of dissolved oxygen required by organisms for the aerobic decomposition of organic matter present in water. This is measured at 20 degrees Celsius for a period of five days. The parameter yields information on the degree of water pollution with organic matter.

Dissolved Oxygen (DO) is the amount of gaseous oxygen (O₂) actually present in water expressed in terms of its presence in the volume of water (milligrams of O₂ per litre).

Chemical Oxygen Demand (COD) is the index of water pollution measuring the mass concentration of oxygen consumed by the chemical breakdown of organic and inorganic matter. This is a measure of potassium permanganate (KMnO₄) consumed, calculated in terms of oxygen equivalent.

Total Dissolved Solids (TDS) is the total weight of dissolved mineral constituents in water. Excessive amounts make water unsuitable for drinking or for use in industrial processes.

Total Phosphorus is the sum of phosphorus compounds in water measured in terms of phosphorus. Phosphorus is an element that, while being essential to life as a key limiting nutrient factor, nevertheless contributes - together with nitrogen - to the eutrophication of lakes and other bodies of water.

Total Nitrogen is the sum of inorganic and organic nitrogen compounds (excluding N₂) in water measured in terms of nitrogen. Nitrogen - together with phosphorus - contributes to eutrophication of water bodies.

Faecal Coliform is micro organisms found in the intestinal tract of human beings and animals. Their presence in water indicates faecal pollution rendering water unsuitable for drinking without prior treatment.

Method of Computation

Water Quality of Selected Rivers was obtained from questionnaires distributed to Member States/Associate Members through a UNSD/UNEP/CARICOM collaboration according to the categories mentioned above.

Indicator Relevance

The quality of water fit for human consumption can be measured via biological, physicochemical and chemical variables. A major cause of the deterioration of *water quality* is the discharge of industrial and household wastes into water bodies. Coastal zones, estuaries and shorelines of large lakes are particularly favoured for the location of highly polluting industries because they appear to be an easy solution for waste disposal.

The contaminants of major concern are toxins such as heavy metals and pesticides, organic matter, nutrient loadings such as fertilizer run-off, deposits from acid precipitation and pathogens such as coliform. Such contamination can lead to, inter alia, eutrophication and the spread of water borne diseases, and can therefore be detrimental to both human health and the health of aquatic ecosystems.

In the CARICOM Member States, a common threat to the water quality is the contamination of supply by human and livestock waste, industry-related pollution, and in some cases, pesticides and other agricultural chemicals. The domestic waste problem may be linked to inefficient waste water treatment plants in the region. In many instances waste is inadequately treated before being discharged into receiving water bodies. The leaching of pollutants into ground water supplies is also a concern in CARICOM Member States, as is, salt water intrusion into ground water supplies. Salt water intrusion into aquifers is a major issue in countries like Barbados which is heavily dependent on its ground water supply.

Pollutants in water bodies in CARICOM Member States come from either point or non point sources. Point sources of pollution include specific agricultural and industrial sites that discharge heavy metals such as lead, zinc, copper, and nutrients like phosphates. Petroleum products and domestic waste, mentioned previously, are also regarded as point source pollutants.

The major non-point sources of pollution in CARICOM Member States are agricultural runoff, storm-water run-off and percolation of contaminated water from solid waste landfills and sewerage systems. Pesticides and fertilisers are some of the deleterious components of contaminated agricultural runoff.

Data Assessment

Of the eighteen Member States and Associate Members that usually report data, Jamaica and Trinidad and Tobago were the only countries that provided data for this indicator.

Both Member States followed the internationally recommended definition for the collection of this indicator. This indicator is harmonized.

Data Sources

In accordance with the decision that the UNSD would provide data on waste, water, land, and air to the CARICOM Secretariat, data for this indicator was collected from the UNSD instead of from Member States and Associate Members.

Please refer to **Appendix 1.12.6 (a)** for the original sources of the data, as specified by the UNSD, on water of Member States and Associate Members.

Evaluation

The quality of water fit for human consumption can be measured via biological, physicochemical and chemical variables. Most of the water quality studies in the country have been restricted to the Caroni River Basin because it accounts for 30 per cent of the drinking water for the country. The Caroni River was identified as a major source of pollution for the Gulf of Paria, which is located along the west coast. Data is presented for Jamaica and Trinidad and Tobago in **Table 12.6** below.

Table 12.6: Water Quality of Selected Rivers: 1990, 1995 - 1998 and 2000 - 2002

Country	Year	Name of River	Name of Measuring station	Distance to mouth or downstream frontier: Mean	Sampling frequency (/year)		Sampling depth (m)	Annual average flow m ³ /s	Biochemical oxygen demand (BOD ₅) mg O ₂ /l	Dissolved oxygen (DO)	Total dissolved solids (TDS)	Total Suspended Solids (TSS) mg/l	Nitrate (NO ₃) mg/l
					Min	Max							
JM (Wag Water River)	2001								a 0.1 - 9.27				
TT	2000 ¹	Maraval River	WASA Maraval Raw	5			0.3						5.9
	2001 ²	Maraval River	WASA Maraval Raw	5			0.3						4.6
	1997 ³	Caroni River		20				12.2	10	5	140	32	
	1990 ⁴	Caroni River at W.T.P.							3	5			
	1995 ⁴	Caroni River at W.T.P.							2	4			
	1996 ⁴	Caroni River at W.T.P.							3	2			
	2000 ¹	Caura	WASA Caura Raw	4									1.2
	2001 ²	Caura	WASA Caura Raw	4									1.9
	2000 ¹	Guanapo	WASA Guanapo Raw	8									1.2
	2001 ²	Guanapo	WASA Guanapo Raw	8									1.4
	1998 ^{5A}	Maracas	Mouth of Maracas Raw	8						5			
	2002	Oropuche River - La Fortune Pluck Road				2	0.5			2		35	
	1990 ⁴	North Oropouche at W.T.P.							1.0	8.6			
	1995 ⁴	North Oropouche at W.T.P.							0.7	8.2			
	2002 ^B	Godineau River - La Fortune Pluck Road				2	0.5			0		16	

Table 12.6: Water Quality of Selected Rivers: 1990, 1995 - 1998 and 2000 - 2002

Country	Year	Phosphates (PO ₄)	Total Ammonia (NA ₃)	Chloride (Cl)	pH	Temperature	Conductivity	Turbidity	Salinity	Copper	Zinc (Zn)
		mg/l		mg/l		°C	uS/cm	NTU	%	mg/l	mg/l
JM (Wag Water River)	2001										
TT	2000 ¹	0.1		23.7	6.9		1	5			0.02
	2001 ²	0.1		20.4	7.6		1	2			
	1997 ³				6.9	27	187	86			
	1990 ⁴										
	1995 ⁴										
	1996 ⁴										
	2000 ¹	0.1		11.9	7.5		0.2	5.9			
	2001 ²			15.2	7.8		0.3	0.4			
	2000 ¹			8.0	8.2		0.2	1.1			
	2001 ²			9.3	7.8		0.3	0.6			
	1998 ^{5A}				6.7	27		11	0.20		
	2002	0.6	0.2							4.0	8.0
	1990 ⁴										
	1995 ⁴										
	2002 ^B	0.5	0.2							0.7	3.0

Table 12.6: Water Quality of Selected Rivers: 1990, 1995 - 1998 and 2000 - 2002

Country	Year	Total Organic Carbon (TOC)	Total phosphorus	Total nitrogen	Faecal coliform	Faecal coliform	Dissolved Organic Carbon (DOC)	Dissolved and Dispersed Petroleum Hydrocarbon (DDPH)
		mg/l	mg P/l	mg N/l	MPN/100ml**	Counts/100ml	mg/l	mg/l
JM (Wag Water River)	2001	a	a	a	50 - 1600			
TT	2000 ¹	1.1					1	
	2001 ²	1.33					1	
	1997 ³		1			2,000		
	1990 ⁴				9,260			
	1995 ⁴				4,500			
	1996 ⁴							
	2000 ¹	0.47					0.9	
	2001 ²	1.53					0.1	
	2000 ¹	1.1					1.3	
	2001 ²	1.6					0.8	
	1998 ^{5A}					24,000		
	2002							
	1990 ⁴				2,839			
	1995 ⁴				180			
	2002 ^B							

WT7: WATER QUALITY OF SELECTED COASTAL AREAS**H****Concept and Definition**

The data include the most frequently measured parameters of ambient water quality, for which the annual mean concentrations are to be reported, accompanied by information on the selected water body and measuring station. The selection of the water bodies should be based on their national (economic, demographic, geographic, hydrologic) importance and on the quantity and quality of available measurements. The selection of the measuring station should be based on the availability of longer time series of measurements.

Water Quality

Biochemical Oxygen Demand (BOD₅) is the amount of dissolved oxygen required by organisms for the aerobic decomposition of organic matter present in water. This is measured at 20 degrees Celsius for a period of five days. The parameter yields information on the degree of water pollution with organic matter.

Dissolved Oxygen (DO) is the amount of gaseous oxygen (O₂) actually present in water expressed in terms of its presence in the volume of water (milligrams of O₂ per litre).

Chemical Oxygen Demand (COD) is the index of water pollution measuring the mass concentration of oxygen consumed by the chemical breakdown of organic and inorganic matter. This is a measure of potassium permanganate (KMnO₄) consumed, calculated in terms of oxygen equivalent.

Total Dissolved Solids (TDS) is the total weight of dissolved mineral constituents in water. Excessive amounts make water unsuitable for drinking or for use in industrial processes.

Total Phosphorus is the sum of phosphorus compounds in water measured in terms of phosphorus. Phosphorus is an element that, while being essential to life as a key limiting nutrient factor, nevertheless contributes - together with nitrogen - to the eutrophication of lakes and other bodies of water.

Total Nitrogen is the sum of inorganic and organic nitrogen compounds (excluding N₂) in water measured in terms of nitrogen. Nitrogen - together with phosphorus - contributes to eutrophication of water bodies.

Faecal Coliform is micro organisms found in the intestinal tract of human beings and animals. Their presence in water indicates faecal pollution rendering water unsuitable for drinking without prior treatment.

Method of Computation

Water Quality of Selected Coastal Areas was obtained from questionnaires distributed to Member States/Associate Members through a UNSD/UNEP/CARICOM collaboration according to the categories mentioned above.

Indicator Relevance

See *Water Quality of Selected Rivers* for indicator relevance.

Data Assessment

Trinidad and Tobago was the only Member States that provided data for this indicator. The Member States followed the internationally recommended definition for the collection of this indicator. This indicator is, therefore, harmonized.

Data Sources

In accordance with the decision that the UNSD would provide data on waste, water, land, and air to the CARICOM Secretariat, data for this indicator was collected from the UNSD instead of directly from Member States and Associate Members.

Please refer to **Appendix 1.12.7 (a)** for the original sources of the data, as specified by the UNSD, on water of Member States and Associate Members.

Evaluation

Data for Trinidad and Tobago is presented in **Table 12.7** below on the Water Quality of Selected Coastal Areas for the years 1997, 1998 and 2002.

Table 12.7: Water Quality of Selected Coastal Areas: 1997, 1998 and 2002

Country	Year	Name of the estuary/ coastal location	Name of Measuring station	Depth (m)		Sampling frequency (/year)		Sampling depth (m)	Chlorophyll-a (Chl-a)	Total phosphate (TPO ₄) mg P/l	Ammonia (NH ₃) mg N/l	Copper mg/l	
				Mean	Max	Min	Max						
TT	1998 ^{A1}	Maracas Bay	In Front of Lifeguard Hut					0.7					
	1997 ^B	Gulf of Paria	# 7 Caroni Swamp	1	1	2	2	1.0	0.001				
	1998 ^B	Gulf of Paria	# 7 Caroni Swamp	1	1	2	2	1.0	0.003				
	1997 ^B	Gulf of Paria	# 8 Caroni River	1	1	2	2	1.0	0.020				
	1998 ^B	Gulf of Paria	# 8 Caroni River	1	1	2	2	1.0	0.007				
	1997 ^B	Gulf of Paria	# 5 Pt. Lisas	1	1	2	2	1.0	0.004				
	1998 ^B	Gulf of Paria	# 5 Pt. Lisas	1	1	2	2	1.0	0.011				
	1997 ^B	Gulf of Paria	#2 Guapo Bay	1	1	2	2	1.0	0.002				
	1998 ^B	Gulf of Paria	#2 Guapo Bay	1	1	2	2	1.0	0.007				
	1997 ^B	Gulf of Paria	#4 Point-a-Pierre	1	1	2	2	1.0	0.004				
	1998 ^B	Gulf of Paria	#4 Point-a-Pierre	1	1	2	2	1.0	0.011				
	1997 ^B	Gulf of Paria	#9 Port-of-Spain	1	1	2	2	1.0	0.001				
	1998 ^B	Gulf of Paria	#9 Port-of-Spain	1	1	2	2	1.0	0.002				
	2002 ^B	Godineau River Mouth			1	1	0	2	1.0		0.2	0.7	4.0

Table 12.7: Water Quality of Selected Coastal Areas: 1997, 1998 and 2002

Country	Year	Zinc	pH	Temperature	Turbidity	Salinity	Dissolved oxygen (DO)	Total phosphorus	Total nitrogen	Faecal coliform	Dissolved and Dispersed Petroleum Hydrocarbon (DDPH)
		mg/l		°C	NTU	%	mg/l	mg P/l	mg N/l	MPN/100ml**	mg/l
TT	1998 ^{A1}		8	28.5	1.9	26.8	5.2			120	
	1997 ^B							0.030	0.219		0.37
	1998 ^B							0.023	0.302		1.22
	1997 ^B							0.024	0.476		0.87
	1998 ^B							0.044	0.676		7.94
	1997 ^B							–	0.017		0.72
	1998 ^B							0.069	0.807		0.84
	1997 ^B							0.024	0.371		0.37
	1998 ^B							0.043	0.301		6.39
	1997 ^B							0.029	0.231		3.07
	1998 ^B							0.073	0.922		25.85
	1997 ^B							0.026	0.329		0.87
	1998 ^B							0.031	0.271		6.39
	2002 ^B	11.0									

**Appendix 1.12
Sources of Water Data**

**1.12.1 (a): Sources of Data for Table 12.1 - Renewable Fresh Water Resources:
1990, 1998 - 2002**

Country	Data Source
JAMAICA	Statistical Institute of Jamaica
TRINIDAD AND TOBAGO	Water and Sewerage Authority

**1.12.1 (b): Notes for Table 12.1 - Renewable Fresh Water Resources:
1990, 1998 - 2002**

Country	Notes
TRINIDAD AND TOBAGO	n/a Not Available Info on outflow of surface and ground waters can't be calculated

**1.12.2 (a): Sources of Data for Table 12.2 - Water Abstraction by Source: 1990,
1995 – 2005**

Country	Data Source
BELIZE	Statistical Institute of Belize
JAMAICA	Statistical Institute of Jamaica
ST VINCENT AND THE GRENADINES	Central Water and Sewerage Authority
TRINIDAD AND TOBAGO	Water and Sewerage Authority

1.12.2 (b): Notes for Table 12.2 - Water Abstraction by Source: 1990, 1995 - 2005

Country	Notes
BELIZE	* Units are in million gallons.
JAMAICA	A Data refers to average production of water per day.
ST VINCENT AND THE GRENADINES	A Data refer to Fresh surface water.
TRINIDAD AND TOBAGO	A Includes Water abstraction by water supply industry, Agriculture, forestry and fishing, and Manufacturing industries only. n/a Not available n/app Not applicable The category for "Households" in does not contain any values since this category is not applicable to Table W3. This is due to the fact that the abstraction licences are mainly applied by the agricultural and industrial sectors; households are supplied by public water system.

1.12.3 (a): Sources of Data for Table 12.3 - Water Use by Supply Category and Activities: 1990, 1995 - 2005

Country	Data Source
BELIZE	Statistical Institute of Belize
JAMAICA	Statistical Institute of Jamaica
TRINIDAD AND TOBAGO	Water and Sewerage Authority

1.12.3 (b): Notes for Table 12.3 - Water Use by Supply Category and Activities: 1990, 1995 – 2005

Country	Notes
JAMAICA	A - Projected.
TRINIDAD AND TOBAGO	<p>1. Total water into supply is based on actual flows recorded at the Water and Sewerage Authority's water treatment plants.</p> <p>2. A nominal flow for agricultural use was assumed to be 14 Mld.</p> <p>3. Consumption for Manufacturing industries was derived from actual flows recorded from meters installed.</p> <p>4. The Domestic Demand was determined as follows</p> <ul style="list-style-type: none"> (i) The number of domestic connections (A1, A2, A3 and A4) was determined from the Authority's record. (ii) The population served was estimated assuming occupancy of 4.0 capital/household. (iii) Demand was calculated based on levels suggested by London Economics (1) for each year. <p>5. Unaccounted for Water levels of 55% were assumed. This was based on investigations conducted by the Water and Sewerage Authority within District Metered Areas which it has established.</p> <p>6. % population connected to the public water supply was determined from the population from 4(ii) above, and an estimated total population in 1998 of 1.283 million persons and an annual growth rate of 1.2%</p> <p>7. Information on the period 1990 to 1998 can be estimated based on previous study done by the Japanese International Consultants Agency (JICA) in 1990 - copy to be located</p> <p>n/k Not known</p>

1.12.4 (a): Sources of Data for Table 12.4 - Waste Water Generation: 1995 – 2002

Country	Data Source
TRINIDAD AND TOBAGO	Water and Sewerage Authority of Trinidad & Tobago

1.12.4 (b): Notes for Table 12.4 - Waste Water Generation: 1995 - 2002

Country	Notes
TRINIDAD AND TOBAGO	<p>* Flows above are measured from domestic sewer systems flowing into the Water and Sewerage Authority owned and operated treatment plants.</p> <p>* Flows are estimated in cubic metres per day.</p> <p>X- Information not available.</p>

1.12.5 (a): Sources of Data for Table 12.5 - Waste Water Treatment Facilities: 1990-1991, 1995 – 2002

Country	Data Source
BELIZE	CSO
TRINIDAD AND TOBAGO	Water and Sewerage Authority of Trinidad & Tobago

1.12.6 (a): Sources of Data for Table 12.6 - Water Quality of Selected Rivers: 1990, 1995 - 1998 and 2000 – 2002

Country	Data Source
JAMAICA	Statistical Institute of Jamaica
TRINIDAD AND TOBAGO	<p>EMA (2001). Water Quality Monitoring at some Water Sources in North Trinidad</p> <p>Water and Sewerage Authority</p> <p>EMA (1998). Bacteriological Water Quality Monitoring at Maracas Beach, Trinidad</p> <p>IMA</p>

1.12.6 (b): Notes for Table 12.6 - Water Quality of Selected Rivers: 1990, 1995 - 1998 and 2000 – 2002

Country	Notes
JAMAICA	a 2000 to 2002 data for 47 visits to six stations.
TRINIDAD AND TOBAGO	1 Data represents one observation for that year 2 Data represents the average of two observations for that year 3 Data represents the daily value over one month of monitoring (Aug 11 to Sept 10 1997) Source: EMA (2001). Water Quality Monitoring at some Water Sources in North Trinidad 4 Source : Water and Sewerage Authority Data represents one observation for that year in the wet season 5 Source: EMA (1998). ,Bacteriological Water Quality A Monitoring at Maracas Beach, Trinidad B Source : IMA

1.12.7 (a): Sources of Data for Table 12.7 - Water Quality of Selected Coastal Areas: 1997, 1998 and 2002

Country	Data Source
TRINIDAD AND TOBAGO	EMA (1998) Bacteriological Water Quality Monitoring at Maracas Beach, Trinidad Institute of Marine Affairs

1.12.7 (b): Notes for Table 12.7 - Water Quality of Selected Coastal Areas: 1997, 1998 and 2002

Country	Notes
TRINIDAD AND TOBAGO	A - Source: EMA (1998) Bacteriological Water Quality Monitoring at Maracas Beach, Trinidad B - Institute of Marine Affairs 1 - Data represents one observation for that year in the wet season

