Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT 2010

COUNTRY REPORT

GRENADA

FRA2010/081
Rome, 2010

The Forest Resources Assessment Programme

Sustainably managed forests have multiple environmental and socio-economic functions important at the global, national and local scales, and play a vital part in sustainable development. Reliable and up-to-date information on the state of forest resources - not only on area and area change, but also on such variables as growing stock, wood and non-wood products, carbon, protected areas, use of forests for recreation and other services, biological diversity and forests' contribution to national economies - is crucial to support decision-making for policies and programmes in forestry and sustainable development at all levels.

FAO, at the request of its member countries, regularly monitors the world's forests and their management and uses through the Forest Resources Assessment Programme. This country report forms part of the Global Forest Resources Assessment 2010 (FRA 2010).

The reporting framework for FRA 2010 is based on the thematic elements of sustainable forest management acknowledged in intergovernmental forest-related fora and includes variables related to the extent, condition, uses and values of forest resources, as well as the policy, legal and institutional framework related to forests. More information on the FRA 2010 process and the results - including all the country reports - is available on the FRA Web site (www.fao.org/forestry/fra).

The Global Forest Resources Assessment process is coordinated by the Forestry Department at FAO headquarters in Rome. The contact person for matters related to FRA 2010 is:

Mette Løyche Wilkie
Senior Forestry Officer
FAO Forestry Department
Viale delle Terme di Caracalla
Rome 00153, Italy

E-mail: Mette.LoycheWilkie@fao.org

Readers can also use the following e-mail address: fra@fao.org

Contents

Report preparation and contact persons

The present report was prepared by the following person(s):

Name (FAMILY NAME, First name)	**Institution / address**	**E-mail**	**Fax**	**Tables**
Aden Forteau	Ministry of Agriculture, Forestry and Fisheries, Forestry Department	Michael_forteau@yahoo.co.uk		

Introduction

The Global Forest Resources Assessment (FRA) is of fundamental importance in the management of global forest resources and is certainly no exception in the Grenada context. Not only does FRA provide valuable information pertaining to the present state of resources, but it also shows trends in use, depletion and expansion. Such data can be use as a tool to derive management strategies to address problems facing the particular resources.

The assessment is quite timely and crucial for Grenada, in that the data obtained can be used as a bench mark particularly for comparative analysis of our forest resources. Hurricane Ivan and Emily (2004 and 2005 respectively), seriously devastated our island causing damage to approximately ninety percent of our forest resources. FRA now presents the opportunity to collect data that can help to guide management decision, determine forest recovery and expansion rates. Global FRA also makes it possible for easy information shearing on the state of forest around the world.

Most of the information provided in this report, is based on estimates that more or less reflect the real situation. However, there is a desperate need for reliable, up-to-date and accurate information on our forest resource. In this regard, technologies including advanced GIS / remote sensing and field assessment are of paramount importance. Additionally, training and mechanisms to provide financial support to facilitate FRA for Small Island Developing States (SIDS) such as Grenada should be considered in the interest of sustainable Global Forest Assessment.

1 Table T1 – Extent of Forest and Other wooded land

1.1 FRA 2010 Categories and definitions

Category	Definition
Forest	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds *in situ*. It does not include land that is predominantly under agricultural or urban land use.
Other wooded land	Land not classified as "Forest", spanning more than 0.5 hectares; with trees higher than 5 meters and a canopy cover of 5-10 percent, or trees able to reach these thresholds *in situ*; or with a combined cover of shrubs, bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.
Other land	All land that is not classified as "Forest" or "Other wooded land".
Other land with tree cover (Subordinated to "Other land")	Land classified as "Other land", spanning more than 0.5 hectares with a canopy cover of more than 10 percent of trees able to reach a height of 5 meters at maturity.
Inland water bodies	Inland water bodies generally include major rivers, lakes and water reservoirs.

1.2 National data

1.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FAOSTAT	H	Country area	2005	Secondary data source
Paterson, G. 2000. Grenada Country Report: Forestry outlook study for the Caribbean. ***In***: Proceedings of Sub-regional Workshop on Data Collection and Outlook Effort for Forestry in the Caribbean, Port-of-Spain, Trinidad and Tobago, 21-25 February 2000. FAO, Rome	M	Forest area	1991,	Secondary data source. Author cited the Caribbean Conservation Association as source for the data
Purey-Cust, J.R. 1992. Grenada National Forestry Action Programme report, FAO, Rome.	M	Forest area	1982	Secondary data source
Gumbs,F.A.. 1992. Report on Land Use Watershed Management. Grenada. Tropical Forestry Action Plan. FAO, Rome.	M	Forest Class definitions	1992	
Helmer et.al. 2008. Land Cover and Forest Formation Distirubutions for St. Kitts, Nevis, St. Eustatius, Grenada and Barbados from Decision Tree Classification of Cloud-Cleared Satellite Imagery	H	Land cover	2000	

1.2.2 Classification and definitions

Gumbs,F.A.. 1992

National class	Definition
Montain rain forest	Montane thicket was replaced by clumps or groves of Mountain Cabbage (Euterpe sp) palms, sometimes 60-78 feet high and far overtopping the stunted forest. Montane Thicket in Grenada covered the summit of the main watershed from Mount Qua Qua south towards Mount Sinai and lesser ridge tops in the area. *Micrropholis chrysiphylloides* was dominant; nearly all the big trees are of this species, some of them up to six feet in girth. Composition was probably affected by fellings in the past as in the case of the Rain Forest. There was virtually no shrub layer. Epiphytes seemed to be confined to small orchids and ferns, and while there were few climbers, the forest was extremely mossy. Ground vegetation was knee-high and thick beneath typical Montane Thicket, consisting of seedlings, ferns, and razor grass.
Closed evergreen rainforest	Including the lower montane rain forest and the primary and secondary rain forest.
Moist deciduous and semi-deciduous forest	Some low hills near the coastlines were covered with a degraded dry scrub woodland, cactus and acacia bush which probably represented the renmants of a narrow belt of "deciduous seasonal forest" formation which originally grew there.
Abandoned cropland/ grazing land	No definition provided
Scrub/cactus vegetation	This forest types includes; Deciduous Seasonal forest/ Cactus Scrub. Some low hills near the coastlines were covered with a degraded dry scrub woodland, cactus scrub and acacia bush wich probably represented the remnants of a natural narrow belt of deciduous seasonal forest formation wich originally grew here.
Mangrove swamp	Small areas of mangrove swamps: red mangrove, black mangrove, white mangrove and button mangrove.
Inland swamp	No definition provided

According to Helmer et.al (2008), the forest and shrubland classes are designated to the formation level. Formations are adapted from Areces-Malea et al. (1999)[1], who classify Caribbean vegetation according to standards of the US Federal Geographic Data Committee (FGDC 1997)[2].

1.2.3 Original data

1982

National Classification	Area in Acres
Mountain rain forest	4 170
Closed evergreen rainforest	5 630
Moist deciduous and semi-deciduous forest	4 330
Abandoned cropland/ grazing land	7 000
Scrub/cactus vegetation	3 030
Mangrove swamp	470
Inland swamp	70
Total	**24 700**

[1] Areces-Mallea, A., A. S. Weakley, X. Li, R. G. Sayre, J. D. Parrish, C. V. Tipton, and T. Boucher. 1999. A guide to Caribbean vegetation types: classification systems and descriptions. Washington, D.C.: The Nature Conservancy

[2] FGDC. 1997. National vegetation classification standard, Federal Geographic Data Committee, Vegetation Subcommitte. *FGDC-STD-005.* Reston, Virginia: U.S. Geological Survey.

1991

	Forest Area (acres)	Woodland and Scrub (acres)
Grenada	9 800	7 360
Carriacou	450	2 475
Total	**10 250**	**9 835**

2001

Grenada - Main island

Landcover class name	Area (ha)
High-Medium Density Urban or Built-up Land	307.62
Low Density Built-up Land (Rural or Residential)	2459.79
Herbaceous Agriculture - Cultivated Lands	331.56
Nutmeg and Mixed Woody Agriculture	8983.62
Coconut Palm and Mixed Woody Agriculture (Cacao, Banana, other)	282.96
Pasture, Hay or Inactive Agriculture	2352.96
Golf Course	12.24
Drought Deciduous Open Woodland	54.00
Deciduous, Evergreen Coastal and Mixed Forest or Shrubland, with or without succulents	2446.20
Semi-Deciduous Forest (includes Semi-Evergreen Forest)	6608.97
Seasonal Evergreen and Evergreen Forest	6346.89
Sierra Palm, Transitional and Tall Cloud Forest	663.48
Elfin and Sierra Palm Cloud Forest	198.00
Emergent Wetland	44.46
Mangrove	178.65
Quarries	26.28
Coastal Sand and Rock	309.42
Water - Permanent	64.53
TOTAL GRENADA (Main island)	**31671.63**

Grenada - Grenadines

Landcover class name	Area (ha)
Water	12.6
Barren	0.09
Beach White	27.18
Beach Black	4.5
Urban Light Density	940.05
Urban High Density	140.04
Agriculture Cultivated Land	185.31
Forest Dry Deciduous	1869.75
Forest Semi Deciduous	580.68
Forest Evergreen and Seasonal	19.62
Agriculture Woody	18.54
TOTAL Grenadines	**3798.36**

1.3 Analysis and processing of national data

1.3.1 Reclassification into FRA 2010 categories

1982

National Classification	Forest	Other Wooded Land	Other land
Mountain rain forest	100%		
Closed evergreen rainforest	100%		
Moist deciduous and semi-deciduous forest		100%	
Abandoned ruinate cropland/ grazing land			100%
Scrub/cactus vegetation		100%	
Mangrove swamp	100%		
Inland swamp			100%

1991

National Classification	Forest	Other Wooded land	Other land
Forest	100%		
Woodland and scrub		100%	

2001

Grenada - Main island

Landcover class name	Forest	Other wooded land	Other land	OL w. tree cover	Water
High-Medium Density Urban or Built-up Land			100%		
Low Density Built-up Land (Rural or Residential)			100%		
Herbaceous Agriculture - Cultivated Lands			100%		
Nutmeg and Mixed Woody Agriculture			100%		
Coconut Palm and Mixed Woody Agriculture (Cacao, Banana, other)			100%	100%	
Pasture, Hay or Inactive Agriculture			100%		
Golf Course			100%		
Drought Deciduous Open Woodland		100%			
Deciduous, Evergreen Coastal and Mixed Forest or Shrubland, with or without succulents	50%	50%			
Semi-Deciduous Forest (includes Semi-Evergreen Forest)	100%				
Seasonal Evergreen and Evergreen Forest	100%				
Sierra Palm, Transitional and Tall Cloud Forest	100%				
Elfin and Sierra Palm Cloud Forest	100%				
Emergent Wetland			100%		
Mangrove	100%				
Quarries			100%		
Coastal Sand and Rock			100%		
Water - Permanent					100%

Grenada - Grenadines

Landcover class name	Forest	Other wooded land	Other land	OL w. tree cover	Water
Water					100%
Barren			100%		
Beach White			100%		
Beach Black			100%		
Urban Light Density			100%		
Urban High Density			100%		
Agriculture Cultivated Land			100%		
Forest Dry Deciduous	100%				
Forest Semi Deciduous	100%				
Forest Evergreen and Seasonal	100%				
Agriculture Woody			100%	100%	

The reclassification gives the following table:

FRA Categories	Area (1000 hectares)		
	1982	1991	2001
Forest	4 156	4 148	17689
Other wooded land	2 978	3 980	1277
Other land	26 865	25 872	16427
... of which with tree cover			302
Inland water	0	0	77
TOTAL	**34 000**	**34 000**	**35470**

It can clearly be seen that the latest data set from 2001, which is also considered to be of best quality, is not comparable with previous data sets. The 2001 data set has therefore been selected as the basis for this and related reporting tables.

1.3.2 Calibration

According to FAOSTAT, the country area and land area is 34 000 hectares, with zero inland water.

The 2001 data had therefore to be calibrated. Calibration was done on basis of land area, where national data had a total of 35 393 hectares. The calibration factor is 0.96065. This gives the following calibrated data for 2001:

FRA 2010 Category	Hectares
Forest	16993
Other Wooded Land	1227
Other land	15780
... of which with tree cover	290
Inland water	0
TOTAL	**34000**

1.3.3 Estimation and forecasting

Earlier data indicate that no substantial changes in forest cover were taking place. Hurricanes Ivan (2004) and Emily (2005) caused severe damage to the forests. However, these damages did not change the land use and forest cover change has therefore been assumed constant.

1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	2000	2005	2010
Forest	16.99	16.99	16.99	16.99
Other wooded land	1.23	1.23	1.23	1.23
Other land	15.78	15.78	15.78	15.78
...of which with tree cover	0.29	0.29	0.29	0.29
Inland water bodies	0	0	0	0
TOTAL	**34**	**34**	**34**	**34**

1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest	The new data from 2001 indicate substantially more forest than earlier data that were used for FRA 2005.	Earlier data indicate that no substantial change in forest cover were taking place. Hurricanes Ivan (2004) and Emily (2005) caused severe damage to the forests. However, these damages have not changed the land use and forest cover change has therefore been assumed constant.
Other wooded land		
Other land		
Other land with tree cover		
Inland water bodies		

Other general comments to the table

Expected year for completion of ongoing/planned national forest inventory and/or RS survey / mapping	
Field inventory	
Remote sensing survey / mapping	

2 Table T2 – Forest ownership and management rights

There is insufficient data to report on this table. The collapse of the banana industry and the passage of Hurricane Ivan and Emily, have caused an increase in privately owned forest lands (lands that were classified as agriculture have remained abandoned thus changing classification status).

3 Table T3 – Forest designation and management

3.1 FRA 2010 Categories and definitions

Term	Definition
Primary designated function	The primary function or management objective assigned to a management unit either by legal prescription, documented decision of the landowner/manager, or evidence provided by documented studies of forest management practices and customary use.
Protected areas	Areas especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.
Categories of primary designated functions	
Production	Forest area designated primarily for production of wood, fibre, bio-energy and/or non-wood forest products.
Protection of soil and water	Forest area designated primarily for protection of soil and water.
Conservation of biodiversity	Forest area designated primarily for conservation of biological diversity. Includes but is not limited to areas designated for biodiversity conservation within the protected areas.
Social services	Forest area designated primarily for social services.
Multiple use	Forest area designated primarily for more than one purpose and where none of these alone is considered as the predominant designated function.
Other	Forest areas designated primarily for a function other than production, protection, conservation, social services or multiple use.
No / unknown	No or unknown designation.
Special designation and management categories	
Area of permanent forest estate (PFE)	Forest area that is designated to be retained as forest and may not be converted to other land use.
Forest area within protected areas	Forest area within formally established protected areas independently of the purpose for which the protected areas were established.
Forest area under sustainable forest management	To be defined and documented by the country.
Forest area with management plan	Forest area that has a long-term (ten years or more) documented management plan, aiming at defined management goals, which is periodically revised.

3.2 National data

3.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Purey-Cust, J.R. 1992. Grenada National Forestry Action Programme report, FAO, Rome.	H	Protected forest area	1991	Secondary data source
Renard, Y. 1998. Forest policy in Grenada, *Forestry policies in the Caribbean*, FAO Forestry Paper 137/2, p. 261-276.	H	plantation	1996	Secondary data source

3.2.2 Original data

1991

Protected forested land tenures (1991)	Area (ha)
Grand Etang Forest Reserve	1 748
Annandale Watershed	202
Concord Watershed	96
Mt St Catherine State Land	573
Mt Hope/Clabony Watershed	262

1996

Plantation area = 214 ha

3.3 Analysis and processing of national data

3.3.1 Reclassification into FRA 2010 categories

1991

Protected forested land tenures	FRA Classification
Grand Etang Forest Reserve	100% conservation of biodiversity
Annandale Watershed	100% Protection of soil and water
Concord Watershed	100% Protection of soil and water
Mt St Catherine State Land	100% conservation of biodiversity
Mt Hope/Clabony Watershed	100% Protection of soil and water

1996

Plantations = 100% Production

The remaining forest areas and have been classified as “no or unknown function”.

3.3.2 Estimation and forecasting

The values given in the original data were the same values used for all thee reporting years.

3.4 Data for Table T3

Table 3a – Primary designated function

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Production	0.21	0.21	0.21	0.21
Protection of soil and water	0.56	0.56	0.56	0.56
Conservation of biodiversity	2.32	2.32	2.32	2.32
Social services	0	0	0	0
Multiple use	0	0	0	0
Other (please specify in comments below the table)	0	0	0	0
No / unknown	13.9	13.9	13.9	13.9
TOTAL	**16.99**	**16.99**	**16.99**	**16.99**

Table 3b – Special designation and management categories

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate	n.a.	n.a.	n.a.	n.a.
Forest area within protected areas	2.32	2.32	2.32	2.32
Forest area under sustainable forest management	n.a.	n.a.	n.a.	n.a.
Forest area with management plan	n.a.	n.a.	n.a.	n.a.

3.5 Comments to Table T3

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Production		
Protection of soil and water		
Conservation of biodiversity		
Social services		
Multiple use		
Other		
No / unknown designation		
Area of permanent forest estate		
Forest area within protected areas		
Forest area under sustainable forest management		
Forest area with management plan		

Other general comments to the table
In general, available data are insufficient for making good estimates of forest designation. The given figures are just rough estimates.

4 Table T4 – Forest characteristics

4.1 FRA 2010 Categories and definitions

Term / category	Definition
Naturally regenerated forest	Forest predominantly composed of trees established through natural regeneration.
Introduced species	A species, subspecies or lower taxon, occurring outside its natural range (past or present) and dispersal potential (i.e. outside the range it occupies naturally or could occupy without direct or indirect introduction or care by humans).
Characteristics categories	
Primary forest	Naturally regenerated forest of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
Other naturally regenerated forest	Naturally regenerated forest where there are clearly visible indications of human activities.
Other naturally regenerated forest of introduced species *(sub-category)*	Other naturally regenerated forest where the trees are predominantly of introduced species.
Planted forest	Forest predominantly composed of trees established through planting and/or deliberate seeding.
Planted forest of introduced species *(sub-category)*	Planted forest, where the planted/seeded trees are predominantly of introduced species.
Special categories	
Rubber plantations	Forest area with rubber tree plantations.
Mangroves	Area of forest and other wooded land with mangrove vegetation.
Bamboo	Area of forest and other wooded land with predominant bamboo vegetation.

4.2 National data

4.2.1 Original data

Areas under conservation as of table T3 are considered as primary. In 1996 it was reported an area of forest plantations of 214 hectares (see table T3). Remaining forests are considered as other naturally regenerated forests. The 2001 data set used for table T1 indicates the existence of 179 hectares of mangroves.

4.3 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	2.32	2.32	2.32	2.32
Other naturally regenerated forest	14.46	14.46	14.46	14.46
...of which of introduced species	n.a.	n.a.	n.a.	n.a.
Planted forest	0.21	0.21	0.21	0.21
...of which of introduced species	n.a.	n.a.	n.a.	n.a.
TOTAL	**16.99**	**16.99**	**16.99**	**16.99**

Table 4b

FRA 2010 Categories	Area (1000 hectares)			
	1990	2000	2005	2010
Rubber plantations	n.a.	n.a.	n.a.	n.a.
Mangroves (Forest and OWL)	0.18	0.18	0.18	0.18
Bamboo (Forest and OWL)	n.a.	n.a.	n.a.	n.a.

4.4 Comments to Table T4

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Primary forest		
Other naturally regenerating forest		
Planted forest		
Rubber plantations		
Mangroves		
Bamboo	Since the passage of Hurricane Ivan, bamboo has became very prolific and consequently rapidly increasing its area. However, there are no data available to quantify the extent of bamboo.	

Other general comments to the table

5 Table T5 – Forest establishment and reforestation

5.1 FRA 2010 Categories and definitions

Term	Definition
Afforestation	Establishment of forest through planting and/or deliberate seeding on land that, until then, was not classified as forest.
Reforestation	Re-establishment of forest through planting and/or deliberate seeding on land classified as forest.
Natural expansion of forest	Expansion of forests through natural succession on land that, until then, was under another land use (e.g. forest succession on land previously used for agriculture).

5.2 National data

5.2.1 Original data

Afforestation and reforestation activities are insignificant in Grenada.

5.3 Data for Table T5

FRA 2010 Categories	Annual forest establishment (hectares/year)			...of which of introduced species [1)] (hectares/year)		
	1990	2000	2005	1990	2000	2005
Afforestation	0	0	0	0	0	0
Reforestation	0	0	0	0	0	0
...of which on areas previously planted	0	0	0	0	0	0
Natural expansion of forest	n.d.a.	n.d.a.	n.d.a.	n.d.a.	n.d.a.	n.d.a.

Note: The figures for the reporting years refer to the averages for the 5-year periods 1988-1992, 1998-2002 and 2003-2007 respectively.

5.4 Comments to Table T5

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Afforestation		
Reforestation	Prior to Hurricane Ivan in 2004, the need for reforestation operations was very minimal.	
Natural expansion of forest	Natural expansion is is present and is due to land abandonment after the collapse of the banana industry and the passage of Hurricane Ivan . However, the increase is insignificant given the reporting scale.	

Other general comments to the table

6 Table T6 – Growing stock

6.1 FRA 2010 Categories and definitions

Category	Definition
Growing stock	Volume over bark of all living trees more than X cm in diameter at breast height (or above buttress if these are higher). Includes the stem from ground level or stump height up to a top diameter of Y cm, and may also include branches to a minimum diameter of W cm.
Growing stock of commercial species	Growing stock (see def. above) of commercial species.

6.2 National data

6.2.1 Original data

Expert estimates (before 2004) indicate a growing stock approximately 55 m3 per hectare. The hurricanes in 2004 and 2005 severely destroyed the forests, and for 2005 and 2010 expert estimates of about 35 m3/ha and 45 m3/ha respectively have been used.

6.3 Data for Table T6

Table 6a – Growing stock

FRA 2010 category	Volume (million cubic meters over bark)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Total growing stock	0.934	0.934	0.595	0.765	n.d.a	n.d.a	n.d.a	n.d.a
... of which coniferous	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a
... of which broadleaved	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a
Growing stock of commercial species	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a

Table 6b – Growing stock of the 10 most common species

FRA 2010 category / Species name			Growing stock in forest (million cubic meters)		
Rank	Scientific name	Common name	1990	2000	2005
1st					
2nd					
3rd					
4th					
5th					
6th					

7th					
8th					
9th					
10th					
Remaining					
TOTAL					

Note: Rank refers to the order of importance in terms of growing stock, i.e. 1st is the species with the highest growing stock. Year 2000 is the reference year for defining the species list and the order of the species.

Table 6c – Specification of threshold values

Item	Value	Complementary information
Minimum diameter (cm) at breast height[3] of trees included in growing stock (15cm)	15	
Minimum diameter (cm) at the top end of stem for calculation of growing stock (7cm)	7	
Minimum diameter (cm) of branches included in growing stock (4cm)	4	
Volume refers to "above ground**" (AG**) or "above stump" (AS)	AG	

6.4 Comments to Table T6

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total growing stock		
Growing stock of broadleaved / coniferous		
Growing stock of commercial species		
Growing stock composition		

Other general comments to the table

[3] Diameter at breast height (DBH) refers to diameter over bark measured at a height of 1.30 m above ground level or 30 cm above buttresses if these are higher than 1 m.

7 Table T7 – Biomass stock

7.1 FRA 2010 Categories and definitions

Category	Definition
Above-ground biomass	All living biomass above the soil including stem, stump, branches, bark, seeds, and foliage.
Below-ground biomass	All biomass of live roots. Fine roots of less than 2mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Dead wood	All non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.

7.2 National data

7.2.1 Original data

Data from table T6 were used as input for the biomass estimates.

7.3 Analysis and processing of national data

The following conversion factors were used:
BCEF: 2.5 (Between the classes (21-40 and 41-60))
R/S ratio 0.20

7.4 Data for Table T7

FRA 2010 category	Biomass (million metric tonnes oven-dry weight)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Above-ground biomass	2.336	2.336	1.487	1.911	n.d.a	n.d.a	n.d.a	n.d.a
Below-ground biomass	0.467	0.467	0.297	0.382	n.d.a	n.d.a	n.d.a	n.d.a
Dead wood	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a
TOTAL	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a

7.5 Comments to Table T7

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Above-ground biomass		
Below-ground biomass		
Dead wood		

Other general comments to the table

8 Table T8 – Carbon stock

8.1 FRA 2010 Categories and definitions

Category	Definition
Carbon in above-ground biomass	Carbon in all living biomass above the soil, including stem, stump, branches, bark, seeds, and foliage.
Carbon in below-ground biomass	Carbon in all biomass of live roots. Fine roots of less than 2 mm diameter are excluded, because these often cannot be distinguished empirically from soil organic matter or litter.
Carbon in dead wood	Carbon in all non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.
Carbon in litter	Carbon in all non-living biomass with a diameter less than the minimum diameter for dead wood (e.g. 10 cm), lying dead in various states of decomposition above the mineral or organic soil.
Soil carbon	Organic carbon in mineral and organic soils (including peat) to a specified depth chosen by the country and applied consistently through the time series.

8.2 National data

8.2.1 Original data

Data from table T7 were used as input for the carbon estimates. Biomass was multiplied by 0.47 to obtain carbon.

8.3 Data for Table T8

FRA 2010 Category	Carbon (Million metric tonnes)							
	Forest				Other wooded land			
	1990	2000	2005	2010	1990	2000	2005	2010
Carbon in above-ground biomass	1.098	1.098	0.699	0.898	n.d.a	n.d.a	n.d.a	n.d.a
Carbon in below-ground biomass	0.220	0.220	0.140	0.180	n.d.a	n.d.a	n.d.a	n.d.a
Sub-total: Living biomass	***1.318***	***1.318***	***0.838***	***1.078***	n.d.a	n.d.a	n.d.a	n.d.a
Carbon in dead wood	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a
Carbon in litter	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a
Sub-total: Dead wood and litter	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a
Soil carbon	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a
TOTAL	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a	n.d.a

Soil depth (cm) used for soil carbon estimates	

8.4 Comments to Table T8

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Carbon in above-ground biomass		
Carbon in below-ground biomass		
Carbon in dead wood		
Carbon in litter		
Soil carbon		

Other general comments to the table

9 Table T9 – Forest fires

9.1 FRA 2010 Categories and definitions

Category	Definition
Number of fires	Number of vegetations fires per year .
Area affected by fire	Area affected by vegetation fire per year.
Vegetation fire *(supplementary term)*	Any vegetation fire regardless of ignition source, damage or benefit.
Wild fire	Any unplanned and/ or uncontrolled vegetation fire.
Planned fire	A vegetation fire regardless of ignition source that burns according to management objectives and requires limited or no supression action.

9.2 National data

9.2.1 Original data

See final reporting table

9.3 Data for Table T9

Table 9a

FRA 2010 category	Annual average for 5-year period					
	1990		2000		2005	
	1000 hectares	number of fires	1000 hectares	number of fires	1000 hectares	number of fires
Total land area affected by fire	n.a	n.a	n.a	n.a	n.a	n.a
... of which on forest	n.a	n.a	n.a	n.a	.005	10
... of which on other wooded land	n.a	n.a	n.a	n.a	n.a	n.a
... of which on other land	n.a	n.a	n.a	n.a	n.a	n.a

Table 9b

FRA 2010 category	Proportion of forest area affected by fire (%)		
	1990	2000	2005
Wildfire	n.a	n.a	n.a
Planned fire	n.a	n.a	n.a

9.4 Comments to Table T9

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Area affected by fire	In the aftermath of Hurricane Ivan and the consequent built up of debris resulted in periodical fires; however data regarding area is not available.	
Number of fires	Information pertaining to number of fires is not available.	
Wildfire / planned fire	The actual intent or cause of the fires is not known.	

Other general comments to the table

10 Table T10 – Other disturbances affecting forest health and vitality

10.1 FRA 2010 Categories and definitions

Term	Definition
Disturbance	Damage caused by any factor (biotic or abiotic) that adversely affects the vigour and productivity of the forest and which is not a direct result of human activities.
Invasive species	Species that are non-native to a particular ecosystem and whose introduction and spread cause, or are likely to cause, socio-cultural, economic or environmental harm or harm to human health.
Category	**Definition**
Disturbance by insects	Disturbance caused by insect pests.
Disturbance by diseases	Disturbance caused by diseases attributable to pathogens, such as bacteria, fungi, phytoplasma or virus.
Disturbance by other biotic agents	Disturbance caused by biotic agents other than insects or diseases, such as wildlife browsing, grazing, physical damage by animals, etc.
Disturbance caused by abiotic factors	Disturbances caused by abiotic factors, such as air pollution, snow, storm, drought, etc.

10.2 National data

10.2.1 Original data

See final reporting table.

10.3 Data for Table T10

Table 10a – Disturbances

FRA 2010 category	Affected forest area (1000 hectares)		
	1990	2000	2005
Disturbance by insects	.5	0	0
Disturbance by diseases	0	0	0
Disturbance by other biotic agents	0	0	0
Disturbance caused by abiotic factors	0	0	0
Total area affected by disturbances	0.5	0	0

Table 10b – Major outbreaks of insects and diseases affecting forest health and vitality

Description / name	Tree species or genera affected (scientific name)	Year(s) of latest outbreak	Area affected (1000 hectares)	If cyclic, approx. cycle (years)
Pink mealy bug	Hisbiscus elatus	1990	0.5	

Note: Area affected refers to the total area affected during the outbreak.

Table 10c – Area of forest affected by woody invasive species

Scientific name of woody invasive species	Forest area affected 2005 (1000 hectares)
	n.d.a.
Total forest area affected by woody invasive species	

10.4 Comments to Table T10

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Disturbance by insects	The pink mealy bug was the only pest that caused damage to the Hibiscus species.	
Disturbance by diseases		
Disturbance by other biotic agents		
Disturbance caused by abiotic factors		
Major outbreaks		
Invasive species		

Other general comments to the table

11 Table T11 – Wood removals and value of removals

11.1 FRA 2010 Categories and definitions

Category	Definition
Industrial roundwood removals	The wood removed (volume of roundwood over bark) for production of goods and services other than energy production (woodfuel).
Woodfuel removals	The wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

11.2 National data

11.2.1 Original data

Total volume of industrial roundwood removals was 26653.85 board feet or about 139 cubic metres of roundwood over bark. The unit value was $EC 1.30 per board foot giving a total value of $EC 34 650 which then correspond to about 249.50 $EC per m3 of roundwood.

11.3 Analysis and processing of national data

11.3.1 Estimation and forecasting

The same figures were used for all reporting years.

11.4 Data for Table T11

FRA 2010 Category	Industrial roundwood removals			Woodfuel removals		
	1990	2000	2005	1990	2000	2005
Total volume (1000 m^3 o.b.)	0.139	0.139	0.139	n.a.	n.a.	n.a.
... of which from forest	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Unit value (local currency / m^3 o.b.)	249.51	249.51	249.51	n.a.	n.a.	n.a.
Total value (1000 local currency)	**34.65**	**34.65**	**34.65**	n.a.	n.a.	n.a.

Note: The figures for the reporting years refer to the averages of annually affected areas for the 5-year periods 1988-1992, 1998-2002 and 2003-2007 respectively.

	1990	2000	2005
Name of local currency	$EC	$EC	$EC

11.5 Comments to Table T11

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total volume of industrial roundwood removals		
Total volume of woodfuel removals		
Unit value		
Total value		

Other general comments to the table

12 Table T12 – Non-wood forest products removals and value of removals

No data is available for this reporting table.

13 Table T13 – Employment

13.1 FRA 2010 Categories and definitions

Category	Definition
Full-time equivalents (FTE)	A measurement equal to one person working full-time during a specified reference period.
Employment	Includes all persons in paid employment or self-employment.
Paid employment	Persons who during a specified reference period performed some work for wage or salary in cash or in kind.
Self-employment	Persons who during a specified reference period performed some work for profit or family gain in cash or in kind (e.g. employers, own-account workers, members of producers' cooperatives, contributing family workers).

13.2 National data

13.2.1 Original data

See final reporting table.

13.3 Data for Table T13

FRA 2010 Category	Employment (1000 years FTE)		
	1990	2000	2005
Employment in primary production of goods	0.08	0.07	0.06
...of which paid employment	0.06	0.05	0.05
...of which self-employment	0.02	0.02	0.01
Employment in management of protected areas	0.06	0.05	0.05

13.4 Comments to Table T13

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Employment in primary production of goods		
Paid employment / self-employment		
Employment in management of protected areas		

Other general comments to the table

14 Table T14 – policy and legel framework

14.1 FRA 2010 Categories and definitions

Term	Definitions
Forest policy	A set of orientions of actions adorpted by public authorities in harmony with national socio-economics and environmenal policies in a given country to guide future decisions in relation to the management,use and conservation of forest and tree resources for benefit of society.
Forest policy statement	A document that describes the objectives, priortities and means for implementation of forest policy.
National forest programme (nfp)	A generic expression that refers to a wide range of approaches towards forest policy formulation , planning and implementation at national and sub-national levels. The national forest programme provides a framework and guidance for country-driven forest sector development with participation of all stackholders and in consistence with policies of other sectors and international policies.
Law (Act or Code) on forest	A set of rules inacted by the legislative authority of a country regulating the access, management, conservation and use of forest resources.

14.2 Data for Table T14

Indicate the existance of the following (2008):			
Forest policy statement with national scope		X	yes ✔
			No
If Yes above, provide:	Years of endorsement[1]		
	Reference to document		
National forest programme (nfp)		X	yes ✔
			No
If Yes above, provide:	Name of nfp in country		
	Starting year		
	Currant status		In formulation
		X	In implementation ✔
			Under revision
			Process temporarily suspended
	Reference to document or web site	10 year Forestry Strategic Plan	
Law (Act or Code) on forest with national scope		X	Yes, specific forest law exists ✔
			Yes, but rules on forests or incorperated in other (broader) legislation
			No, forest issues are not regulated by national legislation
If Yes above, provide:	Year of enactment[2]	1906	
	Year of last amendment	1985	
	Reference to document	Soil and Water Conservation Ordinance	

If the responsiblity for forest policy – and/or forest law-making is decentralized, please indicate the existence of the following and explain in the comments below the table how he responsibilty for forest policy – law-making is organized in your country .		
Sub-national forestry policy statement		Yes
	X	No ✔
If Yes above, indicate the number of regions/states/provinces with forest policy statements		
Sub-national laws (Act or Code) on forest		yes
	X	No ✔
If Yes above, indicate the number of regions/states/ provinces with laws on forests		

14.3 Comments to Table T14

Variable / categoría	**Comentarios relacionados con los datos, definiciones, etc.**
Declaración de política forestal de ámbito nacional	
Programa forestal nacional (pfn)	
Ley (Decreto o Código) de ámbito nacional en materia de bosques	
Declaraciones subnacionales de política forestal	
Leyes subnacionales (Decretos o Códigos) en materia de bosques	

Other general comments to the table

15 Tabla T15 – international framework

15.1 FRA 2010 Categories and definitions

Terms	Definition
Minister responsible for forest policy-making	Minister holding the main responsiblity for forest issues and formulation of forest policy.
Head of forestry	The head of forestry of the Government Officer responsible for implimenting the mandate of the public administration related to forests.
Level of subordination	Number of administrative levels between the head of forestry and the minister.
University degree	Qualification provided by university after a minimum of 3 years of post secondary education.

15.2 Data for Table T15

Table 15a - Institutions

FRA categories	2008	
Minister responsible for forest policy formulation: please provide full title		
Level of subordination of head of forestry with in the ministry		1st level subordination to minister
	X	2nd level subordination to minister ✔
		3rd level subordination to minister
		4th or lower level subordination to minister
Other public forest agencies at national level	No	
Institution(s) responsible for forest law enforcement	Grenada Police Force / Forestry Department	

Tabla 15b – Human resources

FRA categories	Human resources within public forest institutions					
	2000		2005		2008	
	number	% female	number	% female	number	% female
Total staff	55	14.5	55	14.5	55	14.5
...of which with university degree or equivalent	4	0	4	0	4	0

Notes:

1. includes human resources with public forest institution at sub – national level

2. excludes people employed in state – owned enterprises, education and research,as well as temporary/seasonal workers

16 TableT16 – Education and research

16.1 FRA 2010 Categories and definitions

Term	Definition
Forest- related education	Post – secondary education programme with focus on forests and related subjects.
Doctor's degree (PhD)	University (or equivalent) education with total of 8 years.
Master's degree(MSc) or equivalent	University (or equivalent) education with total of 5 years.
Bachelor's degree(BSc) or equivalent	University (or equivalent) education with total of 3 years.
Technician certificate or diploma	Qualification issued from a technical education institution consisting of 1 to 3 years post secondary education
Publicly funded forest research centers	Research centers primarily implemented research programmes on forest matters. Funding is mainly public or channelled through public institutions.

16.2 National data

16.2.1 Original Data

There is no forest related education in Grenada, neither any publicly funded research centers.

16.3 Data for Table T16

FRA categories	Graduation[1] of students in forest relate education					
	2000		2005		2008	
	number	% female	Number	% female	number	% female
Master's degree (MSC) or equivalent	0	0	0	0	0	0
Bachelor's degree (BSc) or equivalent	0	0	0	0	0	0
Technician certificate/ diploma	0	0	0	0	0	0
FRA catergories	**Professionals working in publicly funded forest research center [2)]**					
	2000		2005		2008	
	number	% female	Number	% female	number	%female
Doctor's degree (PhD)	0	0	0	0	0	0
Master's degree (MSC) or equivalent	0	0	0	0	0	0
Bachelor's degree (BSc) or equivalent	0	0	0	0	0	0

Notes:
1. graduation refers to the number of students that have successfully completed a bachelor's or higher degree or achieved a certificate or diploma as forest technician.
2. covers degree in all sciences, not only forestry.

17 TableT17 – public revenue and collection and expenditure

17.1 FRA 2010 Categories and definitions

Category	Definition
Forest revenue	All government revenue collected from the domestic production and trade of forest product and services. For this purpose, forest products include: roundwood; sawnwood;wood-based panels' pulp and paper; and non-wood forest product. As far as possible, this include revenue collected by all levels of government(i.e central, regional, provincial and municipal level), but it should exclude the income of publicly owned business entities
Public expenditure	All government expenditure on forest related activities. (futher defined below).
Operational expenditure *(sub –category to public expenditure)*	All government expenditure on public institutions solely engaged in forest sector. Where the forest administration is part of a large public agency (e.g. department or ministry), this should only include the forest sector component of agency's total expenditure. As far as possible,this should also include other institutions (e.g. in research, training and marketing) solely engaged in the forest sector, but it should exclude the expenditure of publicly owned business entities
Transfer payments *(sub-category to public expenditure)*	All government expenditure on direct financial incentives paid to non-government and private- sector institutions, enterprises communities or individuals operating in the forest sector to impliment forest related activities.
Domestic funding	Public expenditure funded from domestic public financial resources, including retained forest revenue; forest – related funds and allocation from a national budget (i.e. from none- forest sector public revenue sources).
External fundind	Public expenditure funded from grants and loans from donors, non- governmental organisations, international lending agencies and international organisation, where such funds are channelled through national public institutions.

17.2 National data

17.2.1 Original Data

See final reporting table.

17.3 Data for Table T17

Tabla 17a – Forestry revenues

FRA categories	Revenues (1000 local currency)	
	2000	2005
Forest revenue	11	11

Table 17b – public expenditure in forest sector by funding source

FRA categories	Domestic funding (1000 local currency)		External funding (1000 local currency)		Total (1000 local currency)	
	2000	2005	2000	2005	2000	2005
Operational expenditure	65	10.9	0	0	65	10.9
Transfer payments	10	9.3	0	0	10	9.3
Total public expenditure	16.5	20.2	0	0	16.5	20.2

If transfer payments are made for forest management and conservation, indicate what specifc objective (s) – please tick all that apply.		Reforestation
		Afforestation
		Forest inventory and/or planning
		Conservation of forest biodiversity
		Protection of soil and water
		Forest stand improvement
		Establishment or maintenance of protected areas
		Other, specify below