



Forestry Department

Food and Agriculture Organization of the United Nations

**GLOBAL FOREST RESOURCES
ASSESSMENT 2010**

COUNTRY REPORT

VIETNAM

FRA2010/229

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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 2005 (FRA 2005), which is the most comprehensive assessment to date. More than 800 people have been involved, including 172 national correspondents and their colleagues, an Advisory Group, international experts, FAO staff, consultants and volunteers. Information has been collated from 229 countries and territories for three points in time: 1990, 2000 and 2005.

The reporting framework for FRA 2005 is based on the thematic elements of sustainable forest management acknowledged in intergovernmental forest-related fora and includes more than 40 variables related to the extent, condition, uses and values of forest resources. More information on the FRA 2005 process and the results - including all the country reports - is available on the FRA 2005 Web site (www.fao.org/forestry/fra2005).

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 2005 is:

Mette Løyche Wilkie
Senior Forestry Officer
FAO Forestry Department
Viale delle Terme di Caracalla
Rome 00100, Italy

E-mail: Mette.LoycheWilkie@fao.org

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

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The Global Forest Resources Assessment 2005 Country Report Series is designed to document and make available the information forming the basis for the FRA 2005 reports. The Country Reports have been compiled by officially nominated country correspondents in collaboration with FAO staff. Prior to finalisation, these reports were subject to validation by forestry authorities in the respective countries.

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Report preparation and contact persons

The present report was prepared by the following persons:

Name	Institution / address	E-mail	Fax	Tables
Dinh Huu Khanh (Team leader)	FIPI, Thanh Tri district, Ha Noi, Viet Nam	vienkhanhfipi@yahoo.com	844.38612881	11-17
Nguyen Hong Quang	FPD, No. 2, Ngoc Ha street, Ba Dinh, Ha Noi, Viet Nam	quang241249@vnn.vn		1-4, 9
Tran Hieu Minh	DoF, No. 2, Ngoc Ha street, Ba Dinh, Ha Noi, Viet Nam	minh_tranhieu@yahoo.com		5, 12
Vu Thanh Nam	DoF, No. 2, Ngoc Ha street, Ba Dinh, Ha Noi, Viet Nam	vuthanhnam2005@yahoo.com		11, 12
Le Truong Giang	FIPI, Thanh Tri district, Ha Noi, Viet Nam	giangfipi@yahoo.com		1-4, 6, 12
Vu Ngoc Sinh	FIPI, Thanh Tri district, Ha Noi, Viet Nam	sinhfipi@gmail.com		6-8, 10
Ngo Van Tu	FIPI, Thanh Tri district, Ha Noi, Viet Nam	ngovantu@hn.vnn.vn		7-8

Introduction

Vietnam has been carrying out National Forest Inventory, Assessment and Monitoring of Forest Resources Change Program since 1991. This Program aims to establish forest resource map based on ETM, SPOT images, field checks and data from primary permanent sample plots. This Program is reviewed each 5 years. The results of Program will be used for National Forest Development Strategy and Planning as well as National Forest Development Policies.

However, data of the Program does not cover all needed information for FRA 2010. Therefore, additional sources are used to collect data for FRA 2010 such as: Forestry Inventory and Planning Institute (FIPI), Department of Forestry (DoF), Forestry Protection Department (FPD), Forestry Support Sector Program (FSSP) and others.

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 <i>in situ</i> . 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 <i>in situ</i> ; 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
Database of Forest Inventory and Planning Institute (FIPI) and Ministry of Agriculture and Rural Development (MARD)	H		1992	
Database of Forest Inventory and Planning Institute (FIPI) and MARD	H		1995	
Database of Forest Inventory and Planning Institute (FIPI) and MARD	H		2000	
Database of Protection Forest department (PFD) and FIPI	M		2002	
Database of Protection Forest Department (PFD) and FIPI	M		2003	

1.2.2 Classification and definitions

National class	Definition
Forest	- A site of at least 0.5 ha, with trees higher than 3 m and the canopy cover 0.3 or the growing stock over than 30m ³ /ha. It includes forest plantations. - Bamboo of such a mentioned canopy and at least 5000 stem/ha.
Unused land Land Type I C	The IC means "the land with bushes and scattered wooded trees with regenerated wooded tree density of at least 1000stem/ha and height 1 m upward". It is similar to "Other wood land" of FAO.
Rubber	Areas regulated by Agriculture

1.2.3 Original data

The general statistics office of Vietnam (<http://www.gso.gov.vn/>) provides following national statistics for the year 2007.

Land Use in 2007		Total area in 000 ha
Agricultural land		9,407
	Annual crops land	5,978
	Miscellaneous gardens	623
	Perennial crops land	2,213
	Weed land for animal raising	40
	Water surface land for fishing	553
Forestry land covered by trees		12,051
Specially used land		1,615.9
Homestead land		451.3
Unused land and river, spring, mountain		9,405
	Unused flat land	536
	Unused mountainous land	7,137
	Unused water surface land	150
	River and spring	749
	Non tree rock mountain	618
	Other unused land	215
WHOLE COUNTRY		32,930

FRA Category	Forest area in "000"ha						
	1990	1995	2000	2002	2003	2005	2007
Natural forest	8,396	8,252	9,675	9,879	10,004	10283	10,284
Plantation forest	745	1,050	1,638	1,914	2,090	2,334	2,553
Total forest	9,141	9,302	11,315	11,793	12,094	12,617	12 837
Rubber Plantations	222	278	412	429	436	460	550
Other Wooded land	na	na	1,816	2,166	2,082	1,791	1,524
Other Land with trees	na	na	na	na	na	na	n.a.

Source of data year 2005, 2007: Forest Protection Department, Forestry Program No.32, data of rubber plantation is collected by Center for Information and Statistics of Ministry of Agriculture and Rural Development.

1.3 Analysis and processing of national data

1.3.1 Calibration

FRA Category	Forest area in “000”ha						
	1990	1995	2000	2002	2003	2005	2007
Natural forest	8,396	8,252	9,675	9,879	10,004	10,283	10,284
Plantation forest	745	1,050	1,638	1,914	2,090	2,334	2,553
Rubber Plantations	222	278	412	429	436	460	550
Other Wooded land			1,816	2,166	2,082	1,791	1,524
Other land	21 644	21 427	17 466	16 619	16 395	16 139	16 096
Other Land with trees	na	na	na	na	na	na	n.d.a.
Inland water body	1,924	1924	924	1,924	1,924	1,924	1,924
Total Area of Country	32,931	32,931	32,931	32,931	32,931	32,931	32,931

Source of data year 2005: Forest Protection Department, Forestry Program No.32, data of rubber plantation is collected by Center for Information and Statistics of Ministry of Agriculture and Rural Development.

Calibration is carried out in order to ensure that the total land area/country area match the official UN statistics in FAOSTAT.

FAOSTAT figures for 2005:

Land area: 31 007 (000ha)

Inland water: 1 924 (000ha)

Country area: 32 931 (000ha)

The difference between the total country area and the sum of forest, other wooded land and inland water has been considered as other land.

1.3.2 Estimation and forecasting

Only forecasting has been done to develop figures for Forest (natural forest, forest plantation) for 2010 since the original figures for 1990, 2000, 2005 and 2007 are available. The rubber plantation in year 2010 (630 ha) is come from the rubber development plan.

To use the long time series data in case of natural forests and forest plantation the regression method has been used.

FRA Category	Forest area in “000”ha			
	1990	2000	2005	2010
Natural forest	8,396	9,675	10,283	10,286
Plantation forest	745	1,638	2,334	2,882
Rubber Plantations	222	412	460	630
Other Wooded land	NA	1,816	1,791	1,124
Other land	21 644	17 466	16 139	16,087
Other Land with trees	n.d.a.	n.d.a.	n.d.a.	n.d.a.
Inland water body	1924	1924	1924	1924
Total Area of Country	32,931	32,931	32,931	32,931

1.3.3 Reclassification into FRA 2010 categories

National land use classes	Percentage of a national class belonging to FRA class			
	Forest	Other wooded land	Other land with tree	Other land
Natural Forest	100			
Plantation Forest	100			
Rubber Plantation	100			
Other wooded land		100		

1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	2000	2005	2010
Forest	9,363	11,725	13,077	13,797
Other wooded land	0	1,816	1,791	1,124
Other land	21,644	17,466	16 139	16,087
...of which with tree cover	n.d.a.	n.d.a.	n.d.a.	n.d.a.
Inland water bodies	1,924	1,924	1,924	1,924
TOTAL	32,931	32,931	32,931	32,931

1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest	The country report has added area of rubber in the area of forest for the purposes of reporting to FRA only.	Data of year year 2010 is calculated based on its interrelation for: (i) Forest và (ii) Other wooded land)
Other wooded land	No data are available on the extent of other wooded land in 1990. The area is included under other land.	
Other land	For reporting to FRA purposes only, the country report has adopted the FAOSTAT figures and has adjusted all the differences in area of “Other land”.	
Other land with tree cover		
Inland water bodies		

Other general comments to the table

Vietnam has launched the program of forest resources inventory and monitoring every 5 year. Earlier the data of forest was published by the government at interval of 5 years but from 2002 data the data is ratified and published every year. The forestry officer of each commune yearly sends the data to higher level, which is finally aggregated at the national level. The Forest inventory and planning institute (FIPI) directly collects and analyses the data through its Forest Resources Inventory Assessment and Monitoring Program (FRIAM). The data from Protection Forest Department (PFD) is the statistics collected from local level up to national level.

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

2.1 FRA 2010 Categories and definitions

Category	Definition
Public ownership	Forest owned by the State; or administrative units of the public administration; or by institutions or corporations owned by the public administration.
Private ownership	Forest owned by individuals, families, communities, private co-operatives, corporations and other business entities, private religious and educational institutions, pension or investment funds, NGOs, nature conservation associations and other private institutions.
Individuals (<i>sub-category of Private ownership</i>)	Forest owned by individuals and families.
Private business entities and institutions (<i>sub-category of Private ownership</i>)	Forest owned by private corporations, co-operatives, companies and other business entities, as well as private non-profit organizations such as NGOs, nature conservation associations, and private religious and educational institutions, etc.
Local communities (<i>sub-category of Private ownership</i>)	Forest owned by a group of individuals belonging to the same community residing within or in the vicinity of a forest area. The community members are co-owners that share exclusive rights and duties, and benefits contribute to the community development.
Indigenous / tribal communities (<i>sub-category of Private ownership</i>)	Forest owned by communities of indigenous or tribal people.
Other types of ownership	Other kind of ownership arrangements not covered by the categories above. Also includes areas where ownership is unclear or disputed.
Categories related to the holder of management rights of public forest resources	
Public Administration	The Public Administration (or institutions or corporations owned by the Public Administration) retains management rights and responsibilities within the limits specified by the legislation.
Individuals/households	Forest management rights and responsibilities are transferred from the Public Administration to individuals or households through long-term leases or management agreements.
Private institutions	Forest management rights and responsibilities are transferred from the Public Administration to corporations, other business entities, private co-operatives, private non-profit institutions and associations, etc., through long-term leases or management agreements.
Communities	Forest management rights and responsibilities are transferred from the Public Administration to local communities (including indigenous and tribal communities) through long-term leases or management agreements.
Other form of management rights	Forests for which the transfer of management rights does not belong to any of the categories mentioned above.

2.2 National data

2.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forest inventory and planning institute submit to MARD and publishing	H		1990	
Forest inventory and planning institute submit to MARD and publishing	H		1998	
Forest protection department	H		2002	
Forest protection department	H		2003	
FIPI and PFD submit to MARD and publishing	H		2005	
FIPI and PFD submit to MARD and publishing	H		2007	

2.2.2 Classification and definitions

National class	Definition
Private ownership	Land owned by individuals, families, villages and communes, private co-operatives, religious and educational institutions, pension or investment funds, and other private institutions.
Public ownership	Land owned by the State (national, state and regional governments) or government-owned institutions or corporations or other public bodies including cities, municipalities or land allocated to army, police ...
Other ownership	Not identified

2.2.3 Original data

Category FRA 2005	Forest area by the year (1000 hectares)					
	1990	2000	2002	2003	2005	2007
Private ownership	109	2,255	3,023	2,804	3,120	3,110
Public ownership	5,603	6,402	6,622	9,053	9,398	9,586
Others	3,651	3,068	2,577	673	559	691

Source: from FRA 2005 of Vietnam, Forest Protection Department

2.3 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public ownership	5,603	6,402	9,398
Private ownership	109	2,255	3,120
...of which owned by individuals	n.d.a.	n.d.a.	n.d.a.
...of which owned by private business entities and institutions	n.d.a.	n.d.a.	n.d.a.
...of which owned by local communities	n.d.a.	n.d.a.	n.d.a.
...of which owned by indigenous / tribal communities	n.d.a.	n.d.a.	n.d.a.
Other types of ownership	3,651	3,068	559
TOTAL	9,363	11,725	13,077

Does ownership of trees coincide with ownership of the land on which they are situated?		Yes
	x	No
If No above, please describe below how the two differ:		
In Vietnam, land ownership belongs to Government. But some areas are sent to different organisations, households for forest management and development.		

Table 2b - Holder of management rights of public forests

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public Administration	n.a.	n.a.	n.a.
Individuals	n.a.	n.a.	n.a.
Private corporations and institutions	n.a.	n.a.	n.a.
Communities	n.a.	n.a.	n.a.
Other	n.a.	n.a.	n.a.
TOTAL	n.a.	n.a.	n.a.

2.4 Comments to Table T2

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Public ownership		
Private ownership		
Other types of ownership		
Management rights		

Other general comments to the table

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
Database of Forest Inventory and Planning Institute and MARD	H		1992	
Database of Forest Inventory and Planning Institute and MARD	H		1995	
Database of Forest Inventory and Planning Institute and MARD	H		2000	

Database of Protection Forest Department and FIPI	M		2002	
Database of Protection Forest Department and FIPI	M		2003	
FIPI and PFD submit to MARD and publishing	M		2005	
FIPI and PFD submit to MARD and publishing	M		2007	

3.2.2 Classification and definitions

National class	Definition
Production function	Forest / Other wooded land designated for production and extraction of forest goods, including both wood and non-wood forest products.
Protection	Forest / Other wooded land designated for protection of soil and water. Logging is not allowed. Its compose of watershed, control soil erosion, tidal along costal, fixation moving sand duns, reduce pollution nearby the plant or factories
Bio-diversity forests	Forest / Other wooded land designated for conservation of biological diversity. Forest is protected from logging and the main function is conservation fauna and flora. It is composed of national parks, natural sanctuaries, and historical cultural forest areas.
Social services function	Forest / Other wooded land designated for the provision of social services, which composes of conservation of bio-diversity
Multiple purpose function	Forest / Other wooded land designated to any combination of: production of goods, protection of soil and water, conservation of biodiversity and provision of social services and where none of these alone can be considered as being significantly more important than the others.
No or unknown function	Forest / Other wooded land for which a specific function has not been designated or where designated function is unknown.

3.2.3 Original data

Categories	Area by the year in “000” ha						
	1990	1995	2000	2002	2003	2005	2007
Production forests	5,485	4,925	4,241	4,452	4,552	4,486	5,780
Protection forests	2,925	3,479	5,502	5,614	5,699	6,172	4,979
Bio-diversity	731	898	1,570	1,727	1,843	1,959	2,078
Total without Rubber	9,141	9,302	11,313	11,793	12,094	12,617	12,837
Rubber Area	222	278	412	429	436	460	550
Production with Rubber	5,707	5,203	4,653	4,881	4,988	4,946	6,330
Total Forest with Rubber	9,363	9,580	11,725	12,222	12,530	13,077	13,387

Source: Forest Protection Department, Forest Program No.32

3.3 Analysis and processing of national data

3.3.1 Estimation and forecasting

The figures are available for 1990 and 2005 and hence there is not need to conduct estimation for these years. The forecasting for 2010 has been done with the help of ratio among different categories of designation in 2007 since the regression estimate do not provide right trend for production areas because pre and past 2005 data indicate have apposite trend.

2007

Production: 47% of total forest

Protection: 37% of total forest

Biodiversity conservation: 16% of total forest

Category	Area in 2010 (“000” ha)
Production forest including rubber	6524
Protection of water/soil	5131
Bio-diversity conservation	2142
Total	13797

3.3.2 Reclassification into FRA 2010 categories

National Class	Percentage of a National Class to a FRA Classes of Primary Function					
	Production For./OWL	Protection For./OWL	Conservation of Biodiversity	Social Service	Multiple Function	Unknown Function.
	%	%	%	%	%	%
Production	100					
Protection		100				
Conservation			100			
Multiple Pur.					100	

3.4 Data for Table T3

Table 3a – Primary designated function

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Production	5,707	4,653	4,946	6,524
Protection of soil and water	2,925	5,502	6,172	5,131
Conservation of biodiversity	731	1,570	1,959	2,142
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	0	0	0	0
TOTAL	9,363	11,725	13,077	13,797

Source: Forest Protection Department, Forest Program No.32

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	n.a.	n.a.	n.a.	n.a.
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

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 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Data base of FIPI and MARD	H	Characteristics	1992	
Data base of FIPI and MARD	H	Characteristics	1995	
Data base of FIPI and MARD	H	Characteristics	2000	
Database of PFD and FIPI	M	Characteristics	2002	
Database of PFD and FIPI	M	Characteristics	2003	

4.2.2 Classification and definitions

National class	Definition
Rich Forest	Forest of native species, where there are no clearly visible indications of human activities, the ecological processes are not significantly disturbed and they contain high standing volume (the forest type IV or IIIB).
Impact natural forest	Forest of naturally regenerated native species where there are clearly visible indications of human activities.
Semi-natural	Forest of native species, established through planting, seeding or assisted natural regeneration. But in Vietnam it is not separate semi-natural from impact Natural forest. So that semi-natural forest is included in impact Natural forest.
Productive plantation	Forest of introduced species and in some cases native species established through planting or seeding mainly for production of wood or non-wood goods.
Protective plantation	Forest of native or introduced species, established through planting or seeding mainly for provision of services. Forest of native species which is established on bio-diversity open land is included protective plantation in the national reporting table.

4.2.3 Original data

National Category	Sub-Category	Area in "000" ha.				
		1990	1995	2000	2002	2003
Natural forest						
	Rich forest	384	289	187		
	Other forest types	8,012	7,963	9,488		
	Total	8,396	8,252	9,675	9,879	10,004
Plantation excluding rubber						
	Production	442	623	972	1,137	1,238
	Protection	272	384	599	709	760
	Bio-diversity	31	43	67	68	92
		745	1,050	1,638	1,914	2,090
Rubber		222	278	412	429	436

4.3 Analysis and processing of national data

4.3.1 Estimation and forecasting

A. Rich Forests

The rich forest area in 2005 has been forecasted with the help of linear extra-polation using data of two last points in time (1995 and 2000) since regression is not advisable with only three points in time.

The area of Rich forest in 2005 = 85 (000 ha)

The area of reach forest in 2010 = 80 (000 ha)

B. Other forest types

The area of other forest types for 2005 is simply the area of natural forests in 2005 (Table 1) after excluding the above area of rich forests in 2005.

The area of “Other forest types” in natural forests in 2005 = 10283 (Total of Natural forest area) – 85 (Rich forest area)= 10198 (000 ha)

The area of “Other forest types” in natural forests in 2010 = 10286 (Total of Natural forest area) – 80 (Rich forest area)= 10206 (000 ha)

C. Area of Plantations

To capture the latest trend in relative categories (Productive, Productive and biodiversity conservation) of plantations the ratio among different categories of plantations in 2003 have been applied to the total area of forest plantation (excluding rubber) forecasted for 2005 in Table 1 and the same has been done for 2010.

FRA Category	Forest area in “000”ha						2,007	2,010
	1,990	1,995	2,000	2,002	2,003	2,005		
Natural forest	8,396	8,252	9,675	9,879	10,004	10,283	10,284	10,286
Plantation forest	745	1,050	1,638	1,914	2,090	2,334	2,553	2,882
Rubber Plantations	222	278	412	429	436	460	550	630
Total forest	9,363	9,580	11,725	12,222	12,530	13,077	13,387	13,798

Category of Plantation	2003	%	Area in 2005 (000 ha)	Area in 2010 (000 ha)
Production Plantations	1,238	59	1 382	1707
Protection Plantations	760	36	849	1048
Bio-diversity Plantations	92	4	103	127
Total	2,090		2334	2882

Category	1990	2000	2005	2010
Rich forest	384	187	85	80
Other forest types	8012	9488	10198	10260
Production Plantations	442	972	1383	1707
Protection Plantations	272	599	849	1048
Bio-diversity Plantations	31	67	103	127
Rubber Plantations	222	412	460	630
Total	9,363	11,725	13,077	13,798

4.3.2 Reclassification into FRA 2010 categories

National Category	FRA 2005 Category		
	Primary	Other Naturally regenerated forest	Planted forest
Rich forest	100		
Other forest types		100	
Production Plantations			100
Protection Plantations			100
Bio-diversity			100

Plantations			
Rubber Plantations			100

4.4 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	384	187	85	80
Other naturally regenerated forest	8,012	9,488	10,198	10,205
...of which of introduced species	n.a.	n.a.	n.a.	n.a.
Planted forest	967	2,050	2,794	3,512
...of which of introduced species	n.a.	n.a.	n.a.	n.a.
TOTAL	9,363	11,725	13,077	13,797

Table 4b

FRA 2010 Categories	Area (1000 hectares)			
	1990	2000	2005	2010
Rubber plantations (Forest)	222	412	460	630
Mangroves (Forest and OWL)	73	69	63	60
Bamboo (Forest and OWL)	1,547	1,415	1,475	1,425

Area of natural bamboo and bamboo plantation is about 87,000 ha in year 2005. This area will be reduced in year 2010 because of changing to rubber and others. It would be about 1,425 ha.

Data source: FIPI, National forest resource assessment 2001-2005.

4.5 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	Data calculated from spot 5 image with resolution of 5m by 5m.	
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 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
National program for surveying, evaluating the changes of forest resources	H		2005	

5.2.2 Classification and definitions

National class	Definition
Afforestation	Same to FAO definition
Reforestation	Same to FAO definition
Natural expansion of forest	Same to FAO definition

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	32 260	118 245	138 920			
Reforestation	116 720	209 540	327 785			
...of which on areas previously planted	116 720	209 540	327 785			
Natural expansion of forest	5 720	56 839	543 237			

There is no data of plantation of each species. The following is main species for plantations:

TT	Common name	Scientific name
1	Lát Mexico	<i>Cedrela odorata</i>
2	Lát hoa	<i>Chukrasia tabularia</i> A.Juss
3	Trám trắng	<i>Canarium album</i> (Lour.) Raeusch
4	Keo lai	<i>Acacia mangium</i> x <i>Acacia. Auriculiformis</i>
5	Keo tai trọng	<i>Acacia mangium</i> Wild
6	Keo lá trà	<i>Acacia auriculiformis</i>
7	Keo lưỡi liềm	<i>Acacia crassicaarpa</i> A.Cunn. ex Benth
8	Bạch đàn Urophylla	<i>Eucalyptus. urophylla</i> S.T.Blake
9	Bạch đàn Camall	<i>Eucalyptus camaldulensis</i> Dehanh
10	Phi lao	<i>Casuarina equisetifolia</i> Forst et Forst f
11	Xà cừ	<i>Khaya senegalensis</i> (Desr) A.Fuss
12	Hoè	<i>Sophora Japonica</i> L
13	Trâu	<i>Vernicia montana</i>
14	Xoan ta	<i>Melia azedarach</i>
15	Têch	<i>Tectona grandis</i>
16	Mỡ	<i>Mangletia conifera</i> Dandy
17	Bồ đề	<i>Styrax tonkinensis</i> (Pierre) Craib ex Hardw
18	Chè đắng	<i>Ilex kaushue</i> S.Y.Hu
19	Tông dù	<i>Toona sinensis</i> (A.Juss) M.Roem
20	Tre diêm trúc	<i>Dendrocalamus ohlami</i> Kengf
21	Luông	<i>Dendrocalamus membranaceus</i> Munro
22	Trúc sào	<i>Phyllostachys pubescens</i> Majiel ex.H.de lehaie
23	Quế	<i>Cinnamomum casia</i> (L.) J.Presl
24	Thông mã vĩ	<i>Pinus masoniana</i> Lamb
25	Thông nhựa	<i>Pinus merkusii</i> Jungh.et.de Vries
26	Thông caribê	<i>Pinus caribaea</i> Morelet
27	Thông 3 lá	<i>Pinus kesiya</i> Royle ex Gordon
28	Sa mộc	<i>Cinnamomum casia</i> (L.) J.Presl
29	Hôi	<i>Illicium verum</i> Hook.f
30	Sồi phẳng (dẻ bốp, công)	<i>Lipthocarpus fissus</i> Champ. ex benth
31	Huỳnh	<i>Tarrietia javanica</i> Blume
32	Dó trầm	<i>Aquilarria crassna</i> Pierre ex lecomte
33	Bông gòn	<i>Ceiba pentandra</i> (L.) Gaertn
34	Dầu rái	<i>Dipterocapus alatus</i> Roxb.Ex.G.Don
35	Sao đen	<i>Hopera odorata</i> Roxb
36	Giôi xanh	<i>Michelia meriocris</i> Dandy
37	Boi lời đỏ	<i>Litsea glutinosa</i> (Lowr.) C.B.Rob
38	Xoan mộc	<i>Toona suremi</i> Blume Merr
39	Đước	<i>Rhizophora apiculata</i> Blume
40	Tràm cừ	<i>Melaleuca cajuputi</i> Powell
41	Tràm Loca	<i>Melaleuca leucadendra</i> L

5.4 Comments to Table T5

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Afforestation		
Reforestation	Data is calculated from plantation Wood removals and average yield per ha.	We have no data for reforestation every year. Area of reforestation are included in afforestation. But from other source, reforestation can calculated for reforestation: Most of plantation are belonged to households or forest companies. After cutting on plantation area which are plated in the same year or next year because the land is suitable for planting. these areas are planted in priority. From harvesting wood on plantation and average yield per ha of plantation we calculate the area of cutting. This area is reforestation per year.
Natural expansion of forest	The same to FRA 2010	Data of natural expansion has changed so much because Vietnam launched the 5 million ha of reforestation programme. Natural expansion forest is one component in the programme. The farmers get forestry land and they want to improve natural forest by natural regeneration.

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 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forest Inventory and Planning Institute and MARD	Growing stock	H	1989	
Forest Inventory and Planning Institute and MARD	Growing stock	H	1995	
Forest Inventory and Planning Institute and MARD	Growing stock	H	1999	

6.2.2 Classification and definitions

The following table provides the definition of growing stock used by FIPI.

National class	Definition
Growing Stock	Volume over bark of all living trees more than 8 cm in diameter at breast height (1.3 m). Includes the stem from ground level or stump height up to a top of the tree.

As required by FAO, forest growing stock should be calculated for 2 entities: (1) Volume with bark; (2) commercial stock is the Volume of species of commercial values. Vietnam definition on the mentioned entities is mainly similar to FAO proposal, however stock is not calculated for the land with trees with stock. According to Vietnam definition, the stock only accounts for forest with stock at least of 30m³ and upward. Some of the regulated stock thresholds for calculation can be seen below

Growing stock	<p>It is the over bark standing volume of (standing) trees with diameter of 10 cm and more at the breast height (dbh) or above the buttress (if higher than breast height).</p> <p>Explanation: It includes the stump above the ground surface with minimum diameter of 10 cm.</p> <p>It includes volume of merchantable branches up to a diameter of 5 cm.</p>
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6.2.3 Original data

The FIPI carried out a complete national forest inventory in 1989 but only for the natural forests and submitted to government for publication. From 1991 – 1995, FIPI implemented the program on assessment and monitoring the change of forest resources. The program assessed the state of forest on 5-year cycle. It provided data in 1995. The FIPI carried out another complete national forest inventory in 1999 and that covered both the natural forest and the plantations.

Following table contains national data on over bark growing stock reflecting stem volume including volume of merchantable branches up to a diameter of 5 cm.

Unit: area: ,000ha; Volume: ,000m³

Categories	1989		1995		1999	
	Area	Growing stock	Area	Growing stock	Area	Growing stock
Natural Forest	8,396	638,096	8,252	627,152	9,676	754,728
Plantation Forest	745	n.a.	1,050	22,050	1,639	31,141
Total	9,141	n.a.	9,302	649,202	11,315	785,869

The species wise details of growing stock are not available prior to 1995.

6.3 Analysis and processing of national data

6.3.1 Calibration

6.3.2 Estimation and forecasting

A. Growing Stock in Forests

The inventory figures of 1989 and 1999 are being assumed for 1990 and 2000 respectively. The per hectare growing stock in forests in 2005 is assumed same as in 2000 (78 m³/ha). This per hectare figure has been multiplied by the area of forest in Table 1 to forecast growing stock in forest in 2005.

Categories	Growing Stock (000 m3) in Forests		
	1990	2000	2005
Growing stock (000 m3)	638,096	754,728	802,157
Area (000 ha)	8,396	9,675	10,283
Growing stock/ha (m3/ha)	76	78	78

According to counted data, it is about 74 m³/ha of Growing stock/ha in year 2005. It would be no change in the Growing stock/ha of forest in year 2010. We know that 74m³/ha is not maximum standing volume. It means that the growing stock/ha is increased about 1.5-2% per year. After 5 years the growing stock/ha must be higher. But after 5 years natural forest is added a big area by natural regeneration. These areas are generally low of growing stock. Two process make growing stock not changed so much.

Categories	Growing Stock (000 m3) in Forests			
	1990	2000	2005	2010
Growing stock (000 m3)	638,096	754,650	760,942	761,164
Area (000 ha)	8,396	9,675	10,283	10,286
Growing stock/ha (m3/ha)	76	78	74	74

B. Growing Stock in Forest Plantations (excluding Rubber)

The 1999 growing stock in forest plantations is being assumed for 2000. The per hectare growing stock in plantation in 1995 is being assumed for 1990 and that in 2000 for 2005 as well. The growing stock in forest plantations (excluding rubber) in 1990 and 2005 has been calculated by using the per hectare growing stock figures assumed above and the area reported in Table 1.

Categories	Growing Stock (000 m3) in Forest Plantations				
	1995	2000	1990	2005	2010
Growing stock (000 m3)	22,050	31,122	15,645	44 346	54,749
Area (000 ha)	1050	1,638	745	2 334	2,882
average growing stock (m3/ha)	21	19	21	19	19

Growing stock of forest plantation is low because they are recently established.

According to counted data, it is about 23 m3/ha of Growing stock/ha in year 2005 of plantation. It would be no change in the Growing stock/ha of plantation in year 2010.

Categories	Growing Stock (000 m3) in Forest Plantations				
	1,995	2,000	1,990	2,005	2,010
Growing stock (000 m3)	22,050	31,122	15,645	53,682	66,286
Area (000 ha)	1,050	1,638	745	2,334	2,882
average growing stock (m3/ha)	21	19	21	23	23

C. Growing Stock in Rubber Plantations

No figures are available to estimate growing stock in rubber plantations. Therefore per hectare growing stock figures of forest plantations have been assumed for Rubber plantations.

Categories	Reference Year			
	1990	2000	2005	2010
Growing stock/ha (m3/ha)	21	19	19	19
Area (000 ha)	222	412	480	685
Growing stock (000 m3)	4662	7828	9120	13,015

Categories	Reference Year
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	1990	2000	2005	2010
Growing stock/ha (m3/ha)	21	19	23	23
Area (000 ha)	222	412	460	630
Growing stock (000 m3)	4,662	7,828	10,580	14,490

The data for 1999 of species-wise growing stock has been assumed for 2000 and it has been sorted to identify top 10 species in terms growing stock for the year 2000. The species wise details of growing stock are not available prior to 1995. Therefore, the growing stock for 1990 has been apportioned in same species-wise ration as in 2000 assuming that the percentage species composition of the growing stock in 2000 also holds good for 1990.

	1,990	2,000	2,005	2,010
Natural forest	638,096	754,728	802,157	802,352
Plantations	15645	31122	44346	54,749
Rubber plant	4,662	7,828	8,740	13,015
Total growing stock	658,403	793,678	855,243	870,115

Categories	Growing Stock (000 m3) in Forest Plantations			
	1990	2000	2005	2010
Natural forest	638,096	754,650	760,942	761,164
Plantations	15,645	31,122	53,682	66,286
Rubber plant	4,662	7,828	10,580	14,490
Total growing stock	658,403	793,600	825,204	841,940

6.3.3 Reclassification into FRA 2010 categories

National Classification	Percentage of a National Class to a FRA Class	
	Growing Stock	Commercial Growing Stock
Growing stock	100	

6.4 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	658	794	855	870	n.a.	n.a.	n.a.	n.a.
... of which coniferous	17	16	20	22	n.a.	n.a.	n.a.	n.a.
... of which broadleaved	641	778	835	848	n.a.	n.a.	n.a.	n.a.
Growing stock of commercial species	216	257	267	277	n.a.	n.a.	n.a.	n.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
1 st	Lagerstromia calyculata	Bằng lăng	19	21	22
2 nd	Lythocarpus ducampii	Dẻ đỏ	18	20	21
3 rd	Vatica odorata var. brevipetiolata	Táu mật	14	16	17
4 th	Shorea obtusa	Cà chặc	14	15	16
5 th	Lithocarpus deabatus	Dẻ trắng	13	14	15
6 th	Schima khasiana	Vối thuốc Ấn Độ	12	13	13
7 th	Quercus spp	Sồi	12	13	13
8 th	Syzygium wightianum	Trâm trắng	12	13	13
9 th	Madhuca pasquieri	Sến mật	10	11	12
10 th	Nephelium melliferum	Trường vải	10	11	11
Remaining			526	647	700
TOTAL			658	794	855

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 ¹ of trees included in growing stock (X)	8 cm	Tree with minimum diameter of 8 cm at breast height (1.3 m) is included in calculation of growing stock
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)	5 cm	Minimum diameter of 5 cm at the top end of stem for calculation of growing stock
Minimum diameter (cm) of branches included in growing stock (W)		In Vietnam, branches are not calculated for growing stock
Volume refers to “above ground” (AG) or “above stump” (AS)	AG	In Vietnam, volume refers to “above ground”

6.5 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	It is counted for tree with its diameter over 30 cm	
Growing stock composition		The 1990 figures are based on intra-species composition of 2000

Other general comments to the table

¹ 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 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
.FRA 2010 guidelines		default values for AG-Biomass and BG-Biomass		Annex 5

7.2.2 Classification and definitions

National class	Definition
	No information on national classification and definitions relevant to this table is available

7.2.3 Original data

Since no original data on biomass is available, estimates have been carried out following FRA 2010 Guidelines and using IPCC default values for conversion from growing stock of Table 6 to biomass.

7.3 Analysis and processing of national data

7.3.1 Estimation and forecasting

For Above ground biomass the following factors have been used:

Conifers: 0.9

Broadleaved: 2

For below ground biomass the coefficient of 0.275 has been adopted.

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	1 297	1 546	1 601	1 656	n.a.	n.a.	n.a.	n.a.
Below-ground biomass	356	425	440	456	n.a.	n.a.	n.a.	n.a.
Dead wood	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TOTAL	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

7.5 Comments to Table T7

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Above-ground biomass	Coefficient of coniferous: 0.9 Coefficient of broadleaved: 2.0	
Below-ground biomass	Coefficient 0.275	
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 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
FRA 2010 guidelines		default values for carbon		

8.2.2 Classification and definitions

National class	Definition
	No information on national classification and definitions relevant to this table is available

8.2.3 Original data

The default value of 0,47 has been used to estimate 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	610	727	753	778	n.a.	n.a.	n.a.	n.a.
Carbon in below-ground biomass	168	200	207	214	n.a.	n.a.	n.a.	n.a.
Sub-total: Living biomass	777	927	960	992	n.a.	n.a.	n.a.	n.a.
Carbon in dead wood	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Carbon in litter	49	61	68	72	n.a.	n.a.	n.a.	n.a.
Sub-total: Dead wood and litter	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Soil carbon	440	551	615	651	n.a.	n.a.	n.a.	n.a.
TOTAL	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

8.4 Comments to Table T8

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Carbon in above-ground biomass	Coefficient 0,47	
Carbon in below-ground biomass	Coefficient 0,47	
Carbon in dead wood		
Carbon in litter	Coefficient 5.2 t/ha	
Soil carbon	Coefficient 47 t/ha	

Other general comments to the table

9 Table T9 – Forest fires

No data is available for this table.

10 Table T10 – Other disturbances affecting forest health and vitality

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)
Pine caterpillar	Pinus masoniana Lamb Pinus merkusii Jungh.et.de Vries Pinus caribaea Morelet Pinus kesiya Royle ex Gordon	1998	2.500	15

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 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Department of statistic and information of General department of customs (http://www.vietnamforestry.org.vn/list_news.aspx?ncid=105).	M	Industrial roundwood removals	1990, 2000, 2005	

11.2.2 Classification and definitions

National class	Definition
Big roundwood removals	Length \geq 2.0 m and minimum diameter \geq 22 cm
Small roundwood removals	Length \geq 1.2 m and minimum diameter \geq 6 cm up to big roundwood size
Woodfuel removals	Under small roundwood size

11.2.3 Original data

Production of industrial roundwood (1000 m3)

1988	1989	1990	1991	1992	1995	1999
		3446			2793	

2000	2001	2002	2003	2004	2005	2006
2376	2397	2504	2500		2703	

(Source: Forestry Department (FRA 2005), General Statistics Office for year 2005)

11.3 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.)	3 446	2 376	2 703	26 534	26 685	26 240
... of which from forest	3 446	2 376	2 703	26 534	26 685	26 240
Unit value (local currency / m ³ o.b.)	274 320	469 276	2 775 000	38 100	44 440	70 000
Total value (1000 local currency)	945306720	1114999776	7500825000	1010945400	1185881400	1836800000

	1990	2000	2005
Name of local currency	vnd	vnd	vnd

11.4 Comments to Table T11

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total volume of industrial roundwood removals	Volume of industrial roundwood removals includes constructional wood, processing wood, chip wood. In which, there are about 300,000 m ³ from natural forest, the remaining from plantation in 2005. Round wood includes big and small size.	
Total volume of woodfuel removals	Volume of woodfuel removals is counted by average of fuel consumer and local population. There are 26.24 million people, who are living in or near the forest area. In average a person use one m ³ of firewood per year.	
Unit value	On average, there is about 2.7 million vnd/m ³ . It is an official data. However, the price of plantation wood is much more lower (about 0.5 million vnd/m ³). About 70,000 vnd/ster (Woodfuel in 2005)	
Total value	Total value is calculated from unit value and total volumes.	

Other general comments to the table

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

12.1 FRA 2010 Categories and definitions

Term	Definition
Non-wood forest product (NWFP)	Goods derived from forests that are tangible and physical objects of biological origin other than wood.
Value of NWFP removals	For the purpose of this table, value is defined as the market value at the site of collection or forest border.

NWFP categories

Category
Plant products / raw material
1. Food
2. Fodder
3. Raw material for medicine and aromatic products
4. Raw material for colorants and dyes
5. Raw material for utensils, handicrafts & construction
6. Ornamental plants
7. Exudates
8. Other plant products
Animal products / raw material
9. Living animals
10. Hides, skins and trophies
11. Wild honey and bee-wax
12. Wild meat
13. Raw material for medicine
14. Raw material for colorants
15. Other edible animal products
16. Other non-edible animal products

12.2 National data

12.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Vietnamese Forest Support Sector Program (Chapter9, Page122) (http://www.vietnamforestry.org.vn/list_news.aspx?ncid=105).	H	Value	1999-2004	

12.2.2 Classification and definitions

National class	Definition
Not available	

12.2.3 Original data

NTFPs export turnover

(Unit: mill USD)

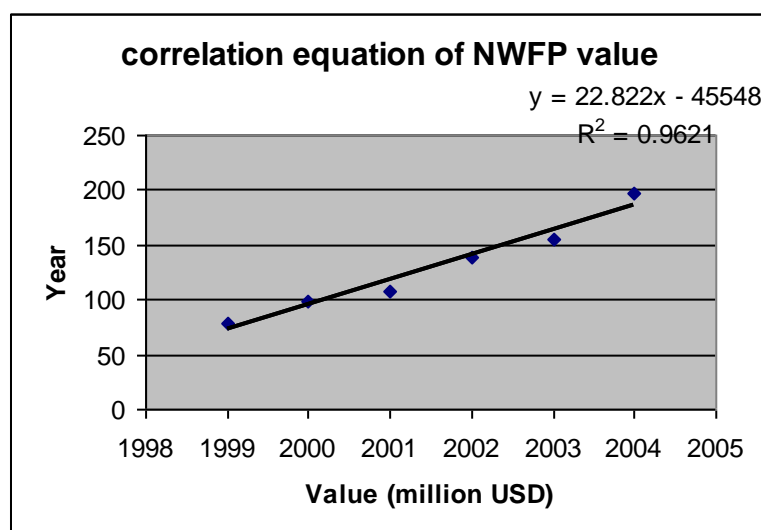
	Bee honey	Shoot	Cinna mon	Herb, medicine	Resin	Bamboo, rattan	Natural chemical	Attar	Rattan products	Total
1999	2.054	0.213	8.309	5.703	4.089	6.523	0.001	3.157	48.216	78.265
2000	3.609	0.276	9.134	5.746	4.335	5.068	0.141	3.68	65.932	97.921
2001	5.669	0.423	10.329	6.164	4.7	4.626	0.046	2.992	73.216	108.165
2002	16.541	0.398	11.022	6.476	4.172	7.621	0.04	3.433	88.747	138.45
2003	18.692	0.305	11.715	6.747	4.939	8.83	0.029	3.595	99.737	154.589
2004	17.93	0.854	11.912	6.576	5.651	9.911	0.863	6.044	138.218	197.959

12.3 Analysis and processing of national data

12.3.1 Calibration

12.3.2 Estimation and forecasting

Table 12.2.3 is collected at Vietnamese customs department (exported). The data for year 2005 (table 12.4) is counted based on its interrelation.



12.4 Data for Table T12

Rank	Name of product	Key species	Unit	NWFP removals 2005		NWF P category
				Quantity	Value (in million USD)	
1 st	Bamboo, rattan				150	5
2 nd	Bee honey				17	1
3 rd	Cinnamon				12	1
4 th	Rattan products				11	8
5 th	Attar				8	7
6 th	Herb, medicine				6.5	3
7 th	Resin				6	7
8 th	Foot of tree				0.9	8
9 th	Natural chemical				0.9	8
10 th						
All other plant products						
All other animal products						
TOTAL					212.3	

	2005
Name of local currency	USD

12.5 Comments to Table T12

Variable / category	Comments related to data, definitions, etc.
10 most important products	Data of the table shows total value of NTFPs which were exported. The value for domestic consumers is not available.
Other plant products	NA
Other animal products	NA
Value by product	It is counted by USD due to exportation
Total value	Total value of NTFP is not counted for domestic consumers including rubber resin

Other general comments to the 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

The data of employment of forestry sector is not available at the national level. It is complicated to estimate forestry labour in the whole country due to some characteristics as below:

Forest and forest land is allocated to households and communities for management, protection and development.

Forest Protection Department manages only staff of national parks which is under management of Ministry of Agriculture and Rural Development.

Provincial People Committees manage staff of parks, protection forest, special-use forest, forest companies (which are under management of provinces).

Labour for rubber plantation is not counted for forestry sector (it belong to Agricultural sector) but area is counted for forestry.

Therefore, forestry labour is collected from existing data and estimation.

13.2.1 Data sources

The employment by production and other activities in forest is not reported at the national level.

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Report of forestry sector	M	Labour of forestry companies, forest protection and special-use forest	2005	

13.2.2 Classification and definitions

National class	Definition
Not available	

13.3 Analysis and processing of national data

13.3.1 Calibration

13.3.2 Estimation and forecasting

Employment through forest with public ownership

According to report of forestry sector, there are about 20,000 staff working for forest companies, forest protection and special-use forest (about 6 million ha).

Employment through rubber plantation

An estimate of labour time to take care of plantations, to protect it from fire and collect resin etc. was developed and applied over the areas of rubber plantation in 1.3.2 to provide data on annual employment. It is assumed that one employment takes care of 4 ha plantation.

	1990	2000	2005
Rubber Plantation	222 000	412 000	460 000
Employment per ha	0.25	0.25	0.25
Employment (FTE)	56 000	103 000	115 000

Employment through forest with private ownership

There are 3.12 million ha which is allocated in 2005 to households and communities. One person may manage 30 ha of forest on average. Therefore, there are about 104,000 people working on this allocated land.

	1990	2000	2005
Forest with Private Ownership	109,000	2,255,000	3,120,000
Employment per ha	0.033	0.033	0.033
Employment (FTE)	4 000	75 000	104 000

Rangers: about 7,000 staff.

13.4 Data for table 13

FRA 2010 Category	Employment (1000 years FTE)		
	1990	2000	2005
Employment in primary production of goods	80	198	239
...of which paid employment	76	123	135
...of which self-employment	4	75	104
Employment in management of protected areas	n.a.	n.a.	7

In Vietnam rubber belongs to agriculture from planting to harvesting. On the forestry sector, rubber is contributed area which supplemented to make increasing forest cover. The value and labours are statistic by agriculture.

13.5 Comments to table 13

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Employment in primary production of goods	Staff in forestry companies, forest protection and special-use forest	
Paid employment / self-employment	Farmers working on allocated forest land	
Employment in management of protected areas	Rangers	

Other general comments

14 Table T14 – Policy and legal framework

14.1 FRA 2010 Categories and definitions

Term	Definition
Forest policy	A set of orientations and principles of actions adopted by public authorities in harmony with national socio-economic and environmental policies in a given country to guide future decisions in relation to the management, use and conservation of forest and tree resources for the benefit of society.
Forest policy statement	A document that describes the objectives, priorities and means for implementation of the 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 stakeholders and in consistence with policies of other sectors and international policies.
Law (Act or Code) on forest	A set of rules enacted 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 existence of the following (2008)			
Forest policy statement with national scope	<input checked="" type="checkbox"/>	Yes	
	<input type="checkbox"/>	No	
If Yes above, provide:	Year of endorsement	2003	
	Reference to document	Viet Nam Forestry Development Strategy 2006 to 2020	
National forest programme (nfp)	<input checked="" type="checkbox"/>	Yes	
	<input type="checkbox"/>	No	
If Yes above, provide:	Name of nfp in country	* 5 million ha of afforestation	
	Starting year	1987	
	Name of nfp in country	National program on forest assessment	
	Starting year	1991	
	Name of nfp in country	Forest and forest land allocation program	
	Starting year	1992	
	Current status	<input type="checkbox"/>	In formulation
		<input checked="" type="checkbox"/>	In implementation
<input type="checkbox"/>		Under revision	
<input type="checkbox"/>		Process temporarily suspended	
Reference to document or web site			
Law (Act or Code) on forest with national scope	<input checked="" type="checkbox"/>	Yes, specific forest law exists	
	<input type="checkbox"/>	Yes, but rules on forests are incorporated in other (broader) legislation	
	<input type="checkbox"/>	No, forest issues are not regulated by national legislation	
If Yes above, provide:	Year of enactment	1992	

	Year of latest amendment	2004
	Reference to document	Law on forest protection and development

In case the responsibility 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 the responsibility for forest policy- and law-making is organized in your country.		
Sub-national forest policy statements	<input type="checkbox"/>	Yes
	<input checked="" type="checkbox"/>	No
If Yes above, indicate the number of regions/states/provinces with forest policy statements		
Sub-national Laws (Acts or Codes) on forest	<input type="checkbox"/>	Yes
	<input checked="" type="checkbox"/>	No
If Yes above, indicate the number of regions/states/provinces with Laws on forests		

14.3 Comments to table T14

Variable / category	Comments related to data, definitions, etc.
Forest policy statement with national scope	Policy on forest and forest land allocation, supporting to plantation, agro-forestry models
National forest programme (nfp)	5 million ha of afforestation program, reducing natural forest harvesting
Law (Act or Code) on forest with national scope	Law on forest protection and development
Sub-national forest policy statements	none
Sub-national Laws (Acts or Codes) on forest	none

Other general comments
Reference: Forest Support Sector Program (Chapter 1, Page 32) http://www.vietnamforestry.org.vn/list_news.aspx?ncid=105

15 Table T15 – Institutional framework

15.1 FRA 2010 Categories and definitions

Term	Definition
Minister responsible for forest policy-making	Minister holding the main responsibility for forest issues and the formulation of the forest policy.
Head of Forestry	The Head of Forestry is the Government Officer responsible for implementing 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 4 years of post secondary education.

15.2 Data for Table T15

Table 15a – Institutions

FRA 2010 Category	2008
Ministry responsible for forest policy formulation : please provide full title	Ministry of agriculture and rural development (MARD)
Level of subordination of Head of Forestry within the Ministry	1 st level subordination on Minister
	x 2 nd level subordination on Minister
	3 rd level subordination on Minister
	4 th or lower level subordination on Minister
Other public forest agencies at national level	Forest inventory and planning institute Vietnam Forest scientific institute
Institution(s) responsible for forest law enforcement	Protection forestry department and its 60 local sub-departments (forest protection) Department of forestry and its 34 local sub-departments (forest development)

Table 15b – Human resources

FRA 2010 Category	Human resources within public forest institutions					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Total staff	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
...of which with university degree or equivalent	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

Notes:

1. Includes human resources within public forest institutions at sub-national level
2. Excludes people employed in State-owned enterprises, education and research, as well as temporary / seasonal workers.

15.3 Comments to Table T15

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Minister responsible for forest policy formulation	Ministry of Agriculture and Rural Development	
Level of subordination of Head of Forestry within the Ministry	Director General of DOF and PFD report to Vice Minister who in turn reports to the Minister.	
Other public forest agencies at national level		
Institution(s) responsible for forest law enforcement	<p>Forestry Department is the agency implementing state management functions on forest planting, forest development, forest resources exploitation and use in the whole country.</p> <p>Forest Protection Department is the agency implementing state management functions in the sector on forest resources protection, law execution of forest management, forest protection and forest product management in the whole country.</p>	
Human resources within public forest institutions		

Other general comments to the table

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16 Table T16 – 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 a total duration of about 9 years.
Master's degree (MSc) or equivalent	University (or equivalent) education with a total duration of about 6 years.
Bachelor's degree (BSc) or equivalent	University (or equivalent) education with a duration of about 4 years.
Technician certificate or diploma	Qualification issued from a technical education institution consisting of 3 years post secondary education.
Publicly funded forest research centers	Research centers primarily implementing research programmes on forest matters. Funding is mainly public or channelled through public institutions.

16.2 National data

16.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forest Sector Support Program http://www.vietnamforestry.org.vn/list_news.aspx?ncid=105		Professionals working in Research Institute	2000, 2005, 2008	

16.3 Data for Table T16

FRA 2010 Category	Graduation ¹⁾ of students in forest-related education					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Master's degree (MSc) or equivalent	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Bachelor's degree (BSc) or equivalent	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Forest technician certificate / diploma	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
FRA 2010 Category	Professionals working in publicly funded forest research centres ²⁾					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Doctor's degree (PhD)	27	NA	30	14	n.a.	n.a.
Master's degree (MSc) or equivalent	52	NA	76	12	n.a.	n.a.
Bachelor's degree (BSc) or equivalent	207	NA	195	35	n.a.	n.a.

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 degrees in all sciences, not only forestry.

16.4 Comments to Table T16

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Graduation of students in forest-related education	There are 5 universities for forestry training in Vietnam: Forestry University of Vietnam, Thai Nguyen Agriculture and Forestry university, Tay Nguyen university, Hue Agriculture and Forestry university, Thu Duc Agriculture and Forestry university. However, there are some faculties in these universities which are not much relating to forestry such as business management, accounting. In addition, there are some provincial universities/colleges with having forestry faculty. Some staff have been trained abroad. Therefore, there is no data on forestry education at different levels.	
Professionals working in public forest research centres	Forestry Science Institute of Viet Nam is the major forestry research agency. There are 3 thematic research centers (Center for Forest Tree Species Research, Center for Ecological and Environmental Research, and Center for Forestry and Specialty Species, Forest Biotechnology), and 8 regional centers. Table 16.4 shows number of staff funding by Government of Vietnam from source. http://www.vietnamforestry.org.vn/list_news.aspx?ncid=105	

Other general comments

17 Table T17 – Public revenue 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 products and services. For this purpose, forest products include: roundwood; sawnwood; wood-based panels; pulp and paper; and non-wood forest products. As far as possible, this should 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 (further defined below).
Operational expenditure (sub-category to Public expenditure)	All government expenditure on public institutions solely engaged in the forest sector. Where the forest administration is part of a larger public agency (e.g. department or ministry), this should only include the forest sector component of the 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 implement forest related activities.
Domestic funding	Public expenditure funded from domestic public financial resources, including: retained forest revenue; forest-related funds; and allocations from the national budget (i.e. from non-forest sector public revenue sources).
External funding	Public expenditure funded from grants and loans from donors, non-governmental organisations, international lending agencies and international organisations, where such funds are channelled through national public institutions.

17.2 National data

17.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Ministry of planning and investment 2007	H	expenditure	2001-2005	

17.2.2 Classification and definitions

National class	Definition
Not available	

17.2.3 Original data

Item	Unit: billion vnd					
	2001	2002	2003	2004	2005	Total

Investment	2,556	2,561	2,808	3,021	3,100	14,047
Operational expenditure	312	330	376	359	455	1,832
Total	2,867	2,891	3,185	3,381	3,555	15,879

Source: Ministry of Planning and Investment

17.3 Analysis and processing of national data

17.3.1 Estimation and forecasting

Data in the year 2000 is estimated based on data of 2001 to 2005 by interrelation.

17.4 Data for Table T17

Table 17a - Forest revenues

FRA 2010 Categories	Revenues (1000 local currency)	
	2000	2005
Forest revenue	n.a.	n.a.

Table 17b - Public expenditure in forest sector by funding source

FRA 2010 Categories	Domestic funding (1000 local currency)		External funding (1000 local currency)		Total (1000 local currency)	
	2000	2005	2000	2005	2000	2005
Operational expenditure	305,000,000	455,000,000	0	0	305,000,000	455,000,000
Transfer payments	1,439,000,000	2,443,000,000	1,058,000,000	657,000,000	2,497,000,000	3,100,000,000
Total public expenditure	1,744,000,000	2,898,000,000	1,058,000,000	657,000,000	2,802,000,000	3,555,000,000
If transfer payments are made for forest management and conservation, indicate for what specific objective(s) - Please tick all that apply.	<input checked="" type="checkbox"/>	Reforestation				
	<input checked="" type="checkbox"/>	Afforestation				
	<input checked="" type="checkbox"/>	Forest inventory and/or planning				
	<input checked="" type="checkbox"/>	Conservation of forest biodiversity				
	<input checked="" type="checkbox"/>	Protection of soil and water				
	<input checked="" type="checkbox"/>	Forest stand improvement				
	<input checked="" type="checkbox"/>	Establishment or maintenance of protected areas				
	<input checked="" type="checkbox"/>	Other, specify below: Forest research Training and education Land allocation Forest extension				

Source: Ministry of plan and investment

17.5 Comments to Table T17

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest revenue		
Operational expenditure		
Transfer payments		

Other general comments to the table