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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 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).

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The Global Forest Resources Assessment Country Report Series is designed to document and make available the information forming the basis for the FRA 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.

Contents

INTRODUCTION.....	5
1 TABLE T1 – EXTENT OF FOREST AND OTHER WOODED LAND.....	6
2 TABLE T2 – FOREST OWNERSHIP AND MANAGEMENT RIGHTS.....	10
3 TABLE T3 – FOREST DESIGNATION AND MANAGEMENT.....	13
4 TABLE T4 – FOREST CHARACTERISTICS.....	17
5 TABLE T5 – FOREST ESTABLISHMENT AND REFORESTATION.....	20
6 TABLE T6 – GROWING STOCK.....	23
7 TABLE T7 – BIOMASS STOCK.....	27
8 TABLE T8 – CARBON STOCK.....	29
9 TABLE T9 – FOREST FIRES.....	31
10 TABLE T10 – OTHER DISTURBANCES AFFECTING FOREST HEALTH AND VITALITY.....	34
11 TABLE T11 – WOOD REMOVALS AND VALUE OF REMOVALS.....	40
12 TABLE T12 – NON-WOOD FOREST PRODUCTS REMOVALS AND VALUE OF REMOVALS.....	44
13 TABLE T13 – EMPLOYMENT.....	45
14 TABLE T14 – POLICY AND LEGAL FRAMEWORK.....	47
15 TABLE T15 – INSTITUTIONAL FRAMEWORK.....	49
16 TABLE T16 – EDUCATION AND RESEARCH.....	51
17 TABLE T17 – PUBLIC REVENUE COLLECTION AND EXPENDITURE.....	54

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Introduction

In the Hungarian statistics on forest area (area under forest management plans) “forest” includes many area actually not covered by stands but closely related to forest management, like roads, clearings, forest glades, nurseries etc. In the national statistics they are categorised to forest areas.

These areas do not have many attributes that international statistical queries require. In MCPFE 2007, seeing its definitions, we used a sophisticated method to proportionately calculate many attributes to the whole forest area, but on the long run it is not practical by consistency reasons. In the FRA 2010 we followed the traditional FRA methodology and many cases we omitted these re-calculations. This is the main reason why FRA 2010 data differ from MCPFE 2007 tables.

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
National Forest Stand Database	H	Total area under forest management plan	1976	
Hungarian Central Statistic Office	H	Other lands, orchards, water surfaces	2005	
FAOSTAT. 2009	H	Inland water bodies	1990, 2000, 2005 and 2007	

The Central Agricultural Office Forestry Directorate (CAOFD, formal State Forest Service) is the national forest authority also responsible for inventory, forestry statistics and management planning. The CAOFD is subordinated to the Ministry of Agriculture and Rural Development, Department of Forestry and fills the function of control, organize and authority concerning forest management, it has statistical tasks in primary wood-processing, provides data for international challenges and helps the Ministry in decision making.

The source of information used is the computerized National Forest Stand Data Base (Database) operated and updated by the CAOFD. This Database is operating since 1976, as a result of the co-operative effort of the organizations of the forestry administration at that time. The system covers all forest lands, which are subject to the Forest Act (dated from 1996). By law forest means surfaces covered by woody species (listed in the annex of the forest act) bigger than 0,50 ha and crown cover higher than 50 % except soil protection forests, where the minimum canopy cover is 30%. The Forest Act prescribes the elaboration of District Forest Management Plans for all forest lands, and also to use the data set of forest management plan for updating the Database as task of the state administration. The forest management planning includes a sub-compartment based forest inventory covering the entire land area in 10 years resulting an annual updating of the Database. Additionally the Database is annually updated by the data on the implementation of the management plans covering the whole forest area. This database is the main data source of the FRA tables.

1.2.2 Classification and definitions

National class	Definition
Forest	Area bigger than 0,50 ha covered by defined (forest) woody species (listed in the annex of the forest act) and at least 50 % crown cover except soil protection forests, where the minimum canopy cover is 30%.
Forest sub-compartment	Forest management unit: basic unit of forest management and forest management planning.
Total area under forest management plan	Contains the area under forest sub-compartment and other sub-compartments supporting forest management like nurseries, rides, crop fields, openings, blank areas, natural forest watercourses, parks and area of forest constructions.
Other wooded land	All wooded lands have forest management plans, so are classified in forest sub-compartments
Other lands	All the area not covered by forest or water.
Orchard	Area consisted for production of fruits from trees.
Water surfaces	Consists all living and standing waters and the reedy surfaces as well

1.2.3 Original data

The Central Agriculture Office, Forestry Directorate – due to the Database used and the updates made through management plans – can provide yearly data for forest sub-compartments, dated from the foundation of the Database up to day. Data concerning water surfaces as well as orchards comes from the Hungarian Central Statistical Office. Area of other lands was calculated: total area of the country minus total area under forest management plan minus water surfaces).

	Area (1 000 hectares)		
	1990	2000	2005
Total area under forest management plan	1801,4	1907,5	1983
Forest sub-compartment	1675,8	1773,3	1853
Other wooded lands	0,0	0,0	0
Other lands	7322,1	7224,3	7125
Orchards	95,1	95,4	103
Water surfaces	210,0	210,0	210
TOTAL for Country	9303,0	9303,0	9303

	Area (1000 ha)			
	1990	2000	2005	2007
Total area	9303	9303	9303	9303
Land area	8987	8962	8961	8961
Inland water	316	341	342	342

FAOSTAT | © FAO Statistics Division 2009 | 26 August 2009

1.3 Analysis and processing of national data

1.3.1 Calibration

As the water surface area is smaller than the “Inland water” in FAOSTAT and an adjustment is needed. The difference in FAOSTAT figures total country area less total land area are used for reporting Inland water bodies

1.3.2 Estimation and forecasting

	Area (1 000 hectares)
	2008
Total area under forest management plan	2019,2
Forest sub-compartments	1890,9
Other wooded land	0,0
Orchard	102,8

The 2010 was derived from latest data from 12. 31.2007 and the planned (and planned to be financed) afforestation figures for the years 2008 and 2009, that is estimated to 10 000 hectares totally.

1.3.3 Reclassification into FRA 2010 categories

	Forest	Other wooded land	Other land with tree cover
Total area under forest management plan	100 %		
Other wooded lands		100 %	
Orchards			100 %

The Other land is calculated as the difference total land area (FAOSTAT) less Total area under forest management plan and Other wooded lands.

1.4 Data for Table T1

FRA 2010 categories	Area (1000 hectares)			
	1990	2000	2005	2010
Forest	1801	1907	1983	2029
Other wooded land	0	0	0	0
Other land	7186	7055	6978	6932
...of which with tree cover ¹ .	95	95	103	103
Inland water bodies	316	341	342	342
Total for country	9303	9303	9303	9303

1. Area of “Other land with tree cover” is included in the area reported under “Other land” and should therefore be excluded when calculating the total area for the country.

1.5 Comments to Table T1

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest	In FRA 2000 the reported data for 1990 included only the total area on forest sub-compartments. Other areas with function included under forest management plans were not counted. Although the FAO and national definitions are not fully equal, the forest area where trees does not grow higher than 5 meters and the canopy cover is between 10-30 % is negligible in Hungary. Consequently the two definitions are considered to be identical in Hungary and no recalculation was applied.	Forest area is continuously increasing due to the intensive afforestation of agricultural land. Natural expansion of forests is very limited.
Other wooded land	Other wooded lands not included in the FRA can be only row of trees, alleys, etc. – having no adequate system (ortho-photos, software, etc.) its quantity could be estimated with great uncertainty. A vague estimation made for 1990 shows	

	that its quantity is not notable. For this reason we decided to report “Other wooded land” figured with zero.	
Other land	In the national reporting table reedy surfaces from “Water surfaces” reported as original data were regrouped in the “Other land” category.	
Other land with tree cover		
Inland water bodies	The 2007 figure as maintained by FAOSTAT has been used for reporting year 2010.	

Other general comments to the table

Expected year for completion of ongoing/planned national forest inventory and/or RS survey / mapping	
Field inventory	Sub-compartment based continuous, covering 10% of the forest area each year, 10 years rotation period.
Remote sensing survey / mapping	Connected to the inventory, full digital database of forest maps and additional remote sensing supporting the annual inventory.

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
National Forest Stand Database	H	Total area under forest management plan (total forest area)	1976-2007	

2.2.2 Classification and definitions

The national classification is rather detailed but the main groups of ownership classes were about the same as in FRA 2010, therefore no specific national definitions are listed below. In case the information on the ownership or on management form was not available in the database (by sub-compartment), the “Other types of ownership” was applied.

2.2.3 Original data

Same categories like FRA 2010, therefore the data are the same as in the FRA table.

2.3 Analysis and processing of national data

2.3.1 Calibration

No special calibration was necessary.

2.3.2 Estimation and forecasting

Since figures were available for all reporting years, no estimation and forecasting was needed.

2.3.3 Reclassification into FRA 2010 categories

Same categories like FRA 2010, no reclassification.

2.4 Data for Table T2

Table 2a - Forest ownership

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public ownership	1792	1132	1150
Private ownership	4	699	831
...of which owned by individuals	4	403	559
...of which owned by private business entities and institutions	0	103	138
...of which owned by local communities	0	194	134
...of which owned by indigenous / tribal communities	0	0	0
Other types of ownership ¹ .	5	75	2
TOTAL	1801	1907	1983

Note: If other types of ownership is reported, please specify details in comment to the table.

1. Category of “Other types of ownership” was applied in case of the information on the ownership or on management form was not available in the database.

Does ownership of trees coincide with ownership of the land on which they are situated?	<input checked="" type="checkbox"/>	Yes
	<input type="checkbox"/>	No
If No above, please describe below how the two differ:		

Table 2b - Holder of management rights of public forests

FRA 2010 Categories	Forest area (1000 hectares)		
	1990	2000	2005
Public Administration	1261	1132	1150
Individuals	0	0	0
Private corporations and institutions	531	0	0
Communities	0	0	0
Other	0	0	0
TOTAL	1792	1132	1150

Forest area managed by the cooperatives but owned by the state. This kind of management category disappeared after 1990 due to the political changes and restitution of the land.

2.5 Comments to Table T2

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Public ownership		Decrease is due to the restitution after 1990. Small change of data in year 2000 compared to FRA 2005 is because of some minor changes of classification of some cooperatives (corrections in the database).
Private ownership		Increase is primarily due to the restitution after 1990. An additional increase of the private forest area is related to the intensive afforestation
Other types of ownership		The trend is related to the disturbances in information after the restitution process between 1990 and 2000. The newly established private ownerships were not perfectly documented and it is visible, that by 2005 the database improved and nearly all forest lands can be correctly classified and grouped into the FRA 2010 classes.
Management rights		The management rights of private corporations and institutions disappeared after 1990 due to the restitution.

Other general comments to the table
After the changes in political structure from 1990 the land restitution process has started in Hungary. This process made changes in the ownership structure of the forests. The implication of the privatization process in forestry can be timely located between the two reporting years with small cross-effects in the period after 2000.

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
National Forest Stand Database	H	Protective forest, protected forests, wood production forest, other productive forest, health-social and touristic forest, education-research forest	1976-2007	

Forests in Hungary are regulated through the Forest Act. This Act defines functions for forests by sub-compartments and these functions are conducted in the Database as well through codes. For a forest sub-compartment three functions can be defined and for this reason almost all of the sub-compartments can be defined as multipurpose forests.

3.2.2 Classification and definitions

National class	Definition
Protective forests	Part of protective forests including forests with role of protecting soil, land, border, game, water, shore, settlement and landscape
Protected forests	Part of protective forests including forests on protected natural areas, forest gene reserves, forest reservations and historical places
Wood production forests	All forests with primary function of wood production
Other productive forests	All forests with primary function of propagation material and Christmas tree production
Health, social and touristic forests	Forests with restrictions in management to serve touristic and social purposes
Education, research and others	Forests to serve educational and research or other (i.e. drainage and liquid manure storage) purposes.
Other subcompartments	Areas in forests serving forest management purposes (forest productive yards, rides, clearings, crop fields, forest roads, landings, parks, infertile areas, etc.) or other purposes (buildings, water surfaces, unproductive areas, etc)
Incomplete codes	Areas with missing primary function codes

3.2.3 Original data

All forests in Hungary have primary function defined. Beside of this, usually they have other functions assigned as well, of course not with the same importance.

	Area (1 000 hectares)			
	1990	2000	2005,	2007
Protective	149,3	248,6	257	264
Protected	72,2	162,5	391	393
Wood production	1323,5	1312,8	1165	1174
Other production	38,4	7,7	12	12
Health, social and touristic	44,9	36,7	21	19
Education, research and others	33,3	5,0	5	5
Other sub-compartments	129,6	133,8	130	129
Incomplete code	10,2	0,5	2	2
TOTAL	1801,4	1907,5	1983	1998

Area with incomplete primary function code is decreased due to the efficient work of fieldworkers.

3.3 Analysis and processing of national data

3.3.1 Calibration

Not needed, the land area figures for the whole country match with FAOSTAT.

3.3.2 Estimation and forecasting

The estimation for 2010 is based on the distribution of year 2007. Two years of afforestation (21000 hectares) is added. Primary designation of afforestations in the recent years was wood production, therefore all afforestations foreseen between 2008 and 2010 are assumed to be productive forests.

3.3.3 Reclassification into FRA 2010 categories

	Forest					
	Production	Protection of soil and water	Conservation of biodiversity	Social services	Multiple purpose	No or unknown function
Protective		100 %				
Protected			100 %			
Wood production	100 %					
Other production	100 %					
Health, social and touristic				100 %		
R+E and others				100 %		
Other subcompartments	Area weighted	Area weighted	Area weighted	Area weighted		Area weighted
Incomplete codes						100 %

3.4 Data for Table T3

Table 3a – Primary designated function

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Production	1467.5	1420.0	1261	1289
Protection of soil and water	160.9	267.3	276	290
Conservation of biodiversity	77.7	174.7	419	424
Social services	84.2	44.8	27	26
Multiple use	0	0	0	0
Other (please specify in comments below the table)	0	0	0	0
No / unknown	11.0	0.6	0	0
TOTAL	1801.4	1907.5	1983	2029

Table 3b – Special designation and management categories

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Area of permanent forest estate	1801	1907	1983	2029
Forest area within protected areas	78	175	419	424
Forest area under sustainable forest management	1801	1907	1983	2029
Forest area with management plan	1801	1907	1983	2029

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		Increasing area is related to management planning and to the increased demand of the society.
Conservation of biodiversity		Increased area designated to nature conservation is partially related to the increasing attention of the society to the importance of nature conservation and the perception of conservationists to protect as many areas as possible. Multy-purpose forest management can even more effectively support the protection of biodiversity than the authoritative, endless designation of protected areas. Therefore in the future it is not necessary to increase the area of protected forests rather to shift the management practice toward the close to nature methods.
Social services		As a result of the more frequently applied close to nature forest management methods the designation of forest areas decreased which does not mean the decrease of the area that is frequently visited and the quality of services provided for the society.
Multiple use	There is no special designation for multiple use in national law, however in the practice nearly all forests are managed for multy purpose use.	
Other		
No / unknown designation		Related to the improvement of the database all compartments are classified by designation and there is no considerable amount of missing data which was not the case in 1990.
Area of permanent forest estate	The national forest act protect all forest land. In case the interest of the society requires the conversion, at least the same size of afforestation is obligatory, the forest area can not decrease.	
Forest area within protected areas	About half of the protected areas are forests, while the proportion of the forest area is only about 20% that underline that forests represent an outstanding richness of biodiversity in Hungary.	Increase of the area of protected forest is highlighted under conservation of biodiversity.
Forest area under sustainable forest management	All forests are under regional forest management plans that is a guarantee to implement sustainable forest management.	
Forest area with management plan	All forests are covered by regional forest management plans.	

Other general comments to the table

Other subcompartments (areas in forests serving forest management purposes) have no designations in National Forest Database. They designation is distributed proportional to the distribution of designations of forest subcompartments.

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 <u>outside</u> 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
National Forest Stand Database	H	Age class distributions	1976-	
National Forest Stand Database	H	Afforestations	1990-2005	Quantity and species composition
Historical records	M	Annual data on regeneration and plantation ways	1900- (except wartime)	Breakdown only for categories: seedlings, sproutings, artificial regeneration, afforestation. No data on species composition.

4.2.2 Classification and definitions

The national definitions are the same as in FRA, however there is no information in the national forest stand database to the regeneration method of a defined stand (sub-compartment). Therefore historical data of regeneration methods, area of afforestation and other integrated data from the database were used for the calculations.

4.2.3 Original data

Age class	Regeneration year	Stand area	Introduced species	Native species	Natural regeneration %	Artificial regeneration %	Afforestation %
1-10	1996-2005	265 863	167 374	98 489	32,0	36,0	32,0
11-20	1986-1995	300 401	197 949	102 452	27,4	49,3	23,3
21-30	1976-1985	277 677	166 534	111 143	24,9	44,8	30,3
31-40	1966-1975	206 232	110 489	95 743	11,9	42,0	46,1
41-50	1956-1965	166 300	71 143	95 157	11,7	36,4	51,9
51-60	1946-1955	129 911	28 625	101 286	14,4	46,3	39,3
61-70	1936-1945	123 618	9 704	113 914	23,8	51,9	24,3
71-80	1926-1935	105 309	6 121	99 188	16,2	62,5	21,3
81-90	1916-1925	82 588	3 767	78 822	16,5	59,4	24,2
91-100	1906-1915	59 476	2 240	57 236	16,8	59,3	23,9
101-	-1905	72 274	1 636	70 639	10,1	74,7	15,2
sum of stands		1 789 648	765 580	1 024 068			
forest		1 983 000					

4.3 Analysis and processing of national data

4.3.1 Estimation and forecasting

For year 2005 a breakdown was calculated based on the 2005 age class distribution compared to the historical regeneration-data. For years 1990, 2000 and 2010 only the effects of afforestations was calculated.

4.3.2 Reclassification into FRA 2010 categories

No reclassification was needed.

4.4 Data for Table T4

Table 4a

FRA 2010 Categories	Forest area (1000 hectares)			
	1990	2000	2005	2010
Primary forest	0	0	0	0
Other naturally regenerated forest	348	398	417	417
...of which of introduced species	166	190	199	199
Planted forest	1453	1509	1566	1612
...of which of introduced species	572	613	650	665
TOTAL	1801	1907	1983	2029

Table 4b

FRA 2010 Categories	Area (1000 hectares)			
	1990	2000	2005	2010
Rubber plantations (Forest)	0	0	0	0
Mangroves (Forest and OWL)	0	0	0	0
Bamboo (Forest and OWL)	0	0	0	0

4.5 Comments to Table T4

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Primary forest	There are forest areas (strictly protected nature conservation areas, soil protection forests) where the human activity is not visible; however there was human activity earlier. We decided not to classify any forests to this category due to the earlier disturbances.	
Other naturally regenerating forest		Data actually available does not reflect properly the tendency of increasing natural regeneration in forests composed by native tree species.
Planted forest		Intensive afforestation is an important factor that continuously increase the area of planted forests.
Rubber plantations		
Mangroves		
Bamboo		

Other general comments to the table

The method has an incontestable elegance, but it is only draft estimation, because there is a great uncertainty on what stands are still alive in an age-class. For example, in the age class 71-80 in 2005 exist 105309 ha forests, but the archive data describes regeneration and afforestation of sum 182450 hectares.

5 Table T5 – Forest establishment and reforestation

5.1 FRA 2010 Categories and definitions

Term	Definition
Afforestation	Forest artificially created on land classified as not forest.
Reforestation	Forest regeneration on land classified as forest.
Natural expansion of forest	Natural expansion of forest on land classified as not forest.

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 Forest Database	H	Afforestation and reforestation initial planting area per year	1976-2007	

5.2.2 Classification and definitions

National class	Definition
Afforestation	Same as FRA.
Reforestation	Same as FRA.
Natural expansion of forest	Same as FRA.

5.2.3 Original data

Reforestation

year	Black locust	Poplar	Pine	Sum	5 year average INTRODUCED	5 year average sum
1976	3940	1767	4274	16666		
1977	4864	1356	3552	17821		
1978	4247	1969	2975	16844		
1979	5420	1799	3319	17209		
1980	5613	2206	3826	18710		
1981	6173	1383	3427	18028		
1982	6549	1953	2984	20722		
1983	6627	2018	2586	19480		
1984	6462	2210	2617	19233		
1985	6587	1836	2374	18524		
1986	6953	2535	2781	20424		
1987	7826	3112	2699	23072		
1988	9855	3596	2125	24292		
1989	8666	4203	1922	22872		
1990	8108	4600	2275	23811	14199	22219
1991	7526	4060	2129	20691		
1992	7178	3155	1599	19429		

1993	6891	2417	1059	16075		
1994	6483	2130	743	15352		
1995	6042	2610	678	15784		
1996	6342	2641	767	16844		
1997	7405	3076	700	18970		
1998	7937	3277	777	20120		
1999	7480	2662	700	18661		
2000	7209	2956	723	19943	11561	20423
2001	7841	3413	753	21551		
2002	8139	3197	741	21842		
2003	7781	2797	690	20921		
2004	7805	2554	538	20995		
2005	6853	2158	960	19331	10355	20061
2006	6643	1870	881	19014		
2007	7171	2234	840	20045		

Afforestation

year	Black locust	Poplar	Pine	Sum	5 year average INTRODUCED	5 year average sum
1976	687	2435	4849	10997		
1977	920	1779	3992	9983		
1978	1215	2633	3039	11015		
1979	1791	1940	3602	10622		
1980	1518	1469	3293	8342		
1981	1403	1180	3618	8397		
1982	1053	1242	2636	7193		
1983	1365	1091	2026	7403		
1984	1433	1131	1732	7596		
1985	2028	1053	1897	7919		
1986	1828	1575	1980	7940		
1987	1810	2306	1691	8360		
1988	2853	2273	1634	8987		
1989	2358	2149	1003	7717		
1990	1800	2094	1015	6879	5464	7486
1991	1737	1622	1199	6709		
1992	2615	2196	771	7138		
1993	1502	958	68	3225		
1994	1262	986	97	2874		
1995	1991	1113	169	4180		
1996	2762	1697	421	6610		
1997	3553	2404	305	8319		
1998	3241	2052	312	8204		
1999	3290	2397	280	8707		
2000	3585	3004	184	9790	7269	10934
2001	4103	3909	224	13137		
2002	4952	4591	222	14830		
2003	4408	3502	255	12015		
2004	2327	1623	8	7574		
2005	2894	1283	96	7657	5851	12036
2006	4425	1622	107	13989		
2007	4899	1698	107	18948		

Analysis and processing of national data

5.2.4 Calibration

No need for calibration.

5.2.5 Estimation and forecasting

Since figures were available for all reporting years, no estimation and forecasting was needed.

5.2.6 Reclassification into FRA 2010 categories

No need for reclassification.

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	7486	10934	12036	5464	7269	5851
Reforestation	22219	20423	20061	14199	11561	10355
...of which on areas previously planted	n.a	n.a	n.a	n.a	n.a	n.a
Natural expansion of forest	n.a	n.a	n.a	n.a	n.a	n.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.

1) Dominant introduced species: black locust (*Robinia pseudoacacia*), improved poplars (*Populus x euramericana* ssp.-s), improved willows (*Salix* ssp.-s), Austrian pine (*Pinus nigra*), Scotch pine (*Pinus silvestris*), spruce (*Picea abies*)

5.4 Comments to Table T5

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Afforestation	Area of initial planting area. Afforestation completed mainly on formal agricultural land, on arid area, for wood supply. That is why the proportion of introduced species, dominated by black locust (<i>Robinia pseudoacacia</i>) is high.	In relation to the changing preferences in the subsidy system in the last 5 years, proportion of native species is increasing.
Reforestation	Area of initial planting area.	Because of spreading of the natural-like forest management, the native species are preferred where site conditions are suitable.
Natural expansion of forest	Not typical. Maximum of 50-100 hectares average per year for the last 30 years can be estimated.	

Other general comments to the table

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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
National Forest Stand Database	H	Growing stock, Rotation age, Restriction, Tree species composition, forest function	1976-2007	

6.2.2 Classification and definitions

National class	Definition
Growing stock	Volume over bark of all living trees including all trees higher than 2 m.
Growing stock of non commercial species	Volume of the non-commodity function forests and the forests of specially protected areas where exploitation is prohibited.
Growing stock of commercial species	Total growing stock minus growing stock of non-commercial areas.

6.2.3 Original data

FRA Categories	Volume (million cubic meters over bark)			
	Forest			
	1990	2000	2005	2007
Growing stock	288.004	325.165	341.394	337.000
Commercial growing stock	275.733	306.785	322.068	

However, all exploited wood materials are matter of commercial activities, not all forest areas with other designation than production can be considered wood suppliers for commercial use. To calculate the commercial growing stock the total growing stock was reduced by the stock of sub-compartments where exploitation is banned.

FRA Categories / Species name (Scientific name and common name)	Growing Stock in Forests (million cubic meters)		
	1990	2000	2005
Quercus petraea	44.948	46.715	45.884
Quercus cerris	38.257	42.472	44.030
Robinia pseudoacacia	34.508	39.169	43.253
Fagus sylvatica	36.733	39.092	39.344
Pinus sylvestris	27.600	32.590	34.209
Quercus robur	30.546	31.947	31.675
Carpinus betulus	17.208	17.880	17.313
Populus x ssp.	13.315	12.956	12.148
Pinus nigra	8.371	10.820	11.690
Fraxinus ssp	7.197	9.485	9.810
Remainder of species	29.324	42.039	52.038
TOTAL	288.007	325.165	341.394

The list of the most important species was made based on the data from 2000.

6.3 Analysis and processing of national data

6.3.1 Calibration

No need for calibration.

6.3.2 Estimation and forecasting

FRA 2005 Categories	Volume (million cubic meters over bark)
	Forest
	2007
Growing stock	347.359
Commercial growing stock	-

The estimation of the growing stock was done by tree species taking into account the growing stock in 31. 12. 2007 + 2 years increment – 2 years felling.

Commercial growing stock of 2010 was calculated according to the ratio of “growing stock of commercial species/total growing stock” in 2005.

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	288.007	325.165	341.394	359.387	0	0	0	0
... of which coniferous	40.875	49.615	52.809	54.887	0	0	0	0
... of which broadleaved	247.133	275.550	288.585	304.500	0	0	0	0
Growing stock of commercial species	275.733	306.785	322.068	339.042	0	0	0	0

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	Quercus petraea	Sessile oak	44.948	46.715	45.884
2 nd	Quercus cerris	Turkey oak	38.257	42.472	44.030
3 rd	Robinia pseudoacacia	Black locust	34.508	39.169	43.253
4 th	Fagus sylvatica	Beech	36.733	39.092	39.344
5 th	Pinus sylvestris	Scots pine	27.600	32.590	34.209
6 th	Quercus robur	English oak	30.546	31.947	31.675
7 th	Carpinus betulus	Hornbeam	17.208	17.880	17.313
8 th	Populus x ssp.	Improved poplars	13.315	12.956	12.148
9 th	Pinus nigra	Austrian pine	8.371	10.820	11.690
10 th	Fraxinus ssp	Ashes	7.197	9.485	9.810
Remaining			29.324	42.039	52.038
TOTAL			288.007	325.165	341.394

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)		All trees higher than 2 m are included
Minimum diameter (cm) at the top end of stem for calculation of growing stock (Y)	0	
Minimum diameter (cm) of branches included in growing stock (W)	0	
Volume refers to “above ground” (AG) or “above stump” (AS)	AS	

“All trees higher than 2 m” means that our Forest Act don’t give thresholds for measuring the growing stock and the formula used counts with trees, branches down to diameter zero.

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.

6.5 Comments to Table T6

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Total growing stock		Growing stock is steadily increasing as a result of sustainable forest management. Annual increment is considerably higher than the annual felling. The forest area increased in the last 20 years about 10 000 hectares annually due to intensive afforestation.
Growing stock of broadleaved / coniferous		<p>Area of oaks, beech and hornbeam is rather stable, therefore the increase of growing stock is modest which is also in relation to the moderate growth of these species compared to black locust or poplars.</p> <p>High proportion of black locust and poplars in afforestations resulted a rapid increase in growing stock.</p> <p>Growing stock of conifers is still increasing what is mainly attributed to the distribution of the age classes. Conifers were widely planted in forestations in the seventies while in the last ten years and also in the future native broadleaves dominate forestations. Close to nature management methods are more frequent than before and in relation to the site conditions have to rely on native broadleaves. Growing stock of <i>Populus x ssp</i> species shows a decline for the reason that a trend of changing these forests with others has started. This change is due to the high intervention of the environmentalist organizations and to the fact that in some places the site was not proper for these stands.</p>
Growing stock of commercial species	Criteria for non commercial forests were revised since the previous FRA therefore the data of commercial growing stock referring to 1990 and 2000 was recalculated and modified.	
Growing stock composition		From 1990 until 2000 the beech with the black locust as well as the Scots pine with the English oak has changed its place.

Other general comments to the table

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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
National Forest Database	H	Area, Wood volume	1990, 2000, 2005	
IPCC Good Practice Guidance	L	Root-to-shoot ratio	2008	
Central Agricultural Office Forestry Directorate, IPC Forests, Forest Condition Monitoring Level 1 sampling method, national grid (4×4 km 1200 plots)	H	Standing dead wood	2007	

7.2.2 Classification and definitions

National class	Definition
Dead wood	The same as in FRA categories but data is available only for standing dead wood.
Below-ground biomass	The same as in FRA categories.
Above-ground biomass	The same as in FRA categories.

Note: Hungary can report dead wood just for standing trees.

7.2.3 Original data

All calculations follow the IPCC Good Practice Guidance and the Guidelines for country reporting methods. The basic data is the growing stock by species in m³ and the area in hectares from the database for 1990, 2000, 2005 and to estimate data for 2010 from 2007. The growing stock figures multiplied with the wood density (WD) values from the IPCC guidelines gives the stem wood biomass (in tonnes). The biomass expansion factor 1.00 (BF) was used to get the above ground biomass (Hungarian yield tables account for stemwood and branchwood as well). The root shoot ratio (R) implicated to get the below ground biomass. Standing deadwood volume is estimated from ICP Forests, Forest Condition Monitoring Level 1 sampling method, national grid (4×4 km, 1200 plots) observations, multiplied by an average wood density.

Only woody biomass has been taken into account.

7.3 Analysis and processing of national data

7.3.1 Calibration

No need for calibration.

7.3.2 Estimation and forecasting

The forecasting is based on the exact figures calculated in the NIR report for the year 2009 (that refers to the year 2007), changes in forested area and in biomass estimated for 2010 and the average growth of the values to be estimated until end of 2009 with linear extrapolation.

7.3.3 Reclassification into FRA 2010 categories

	Above ground biomass	Below ground biomass	Dead wood biomass
Above ground biomass	100 %		
Below ground biomass		100 %	
Dead wood biomass			100 %

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	187	208	217	227	0	0	0	0
Below-ground biomass	47	52	54	57	0	0	0	0
Dead wood	5.2	6.7	8.1	9.9	0	0	0	0
TOTAL	239	267	279	294	0	0	0	0

Thresholds used by the country are the following:

All the procedure for calculus of biomass extent was based on the IPCC method.

Specification of country threshold values	Unit	Value	Complementary information
1. Minimum diameter of fine roots	cm	All included	
2. Minimum diameter of dead wood	cm	All included	

7.5 Comments to Table T7

Calculations are from the UNFCCC report, National Inventory Report for 1985-2007, Hungary (accomplished in 2009). In 2009 some smaller recalculations were applied (some mistakes were corrected), therefore the new data are slightly differs from the former NIRs and the previous FRA.

Dead wood is the same in MCPFE 2007 report. Consist only standing dead wood (no data available on dead trees lying on the ground).

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
National Forest Stand Database	H	Area, Wood volume	1990, 2000, 2005	
IPCC Good Practice Guidance	L	carbon fraction of dry matter, basic wood density	2008	

8.2.2 Classification and definitions

National class	Definition
Carbon in above-ground biomass	The same as in FRA categories
Carbon in below-ground biomass	The same as in FRA categories
Carbon in dead wood	The same as in FRA categories

Note: Hungary can report dead wood just for standing trees.

8.2.3 Original data

Carbon stock was estimated using the method provided by the IPCC Good Practice Guidance. Only woody biomass has taken into account.

8.3 Analysis and processing of national data

8.3.1 Calibration

No need for calibration.

8.3.2 Estimation and forecasting

As described in T7.

8.3.3 Reclassification into FRA 2010 categories

	Carbon in above-ground biomass	Carbon in below-ground biomass	Carbon in dead wood	Carbon in litter	Soil carbon
Carbon in above-ground biomass	100 %				
Carbon in below-ground biomass		100 %			
Carbon in dead wood			100 %		
Carbon in litter				100 %	
Soil carbon					100 %

8.4 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	94	104	109	114	0	0	0	0
Carbon in below-ground biomass	23	26	27	28	0	0	0	0
Sub-total: Living biomass	117	130	136	142	0	0	0	0
Carbon in dead wood	2.6	3.4	4.1	4.9	0	0	0	0
Carbon in litter	n.a	n.a	n.a	n.a	0	0	0	0
Sub-total: Dead wood and litter	n.a	n.a	n.a	n.a	0	0	0	0
Soil carbon	n.a	n.a	n.a	n.a	0	0	0	0
TOTAL	n.a	n.a	n.a	n.a	0	0	0	0

Soil depth (cm) used for soil carbon estimates	n.a
------------------------------------------------	-----

8.5 Comments to Table T8

Other general comments to the table
Calculations from the UNFCCC report, National Inventory Report for 1985-2007, Hungary (accomplished in 2009). In 2009 some smaller recalculations applied, slightly differs from the former NIRs and FRA. Unfortunately no reliable data available for carbon pools in the soil and in the litter. Although these estimations were provided in FRA 2005, they are not verified and no data is corresponded until a reliable calculation based on representative sampling will be available.

9 Table T9 – Forest fires

9.1 FRA 2010 Categories and definitions

Category	Definition
Number of fires	Average number of vegetation fires per year in the country.
Area affected by fire	Average area affected by vegetation fires per year in the country.
Vegetation fire (supplementary term)	Any vegetation fire regardless of ignition source, damage or benefit.
Wildfire	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 suppression action.

9.2 National data

9.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Database of Disaster Recovery Service	M		1991-	
National Forest Stand Database – Forest Fire Information System	M	Area of subcompartments, Fire events data	1998-	
Decree of the Minister of the Interior No. 4/2008. (VIII.1.) BM on protection of forests against fire	H	Fire events data – Burnt area, date and time of fire detection and extinguish, fuel types of burnt areas	2007-	The new system was implemented one year before the issue of the new regulation, where forest fires and vegetation fires are recorded

9.2.2 Classification and definitions

National definitions are the same as in FRA.

Planned fire (like prescribed burning) was traditionally not a practice in Hungary and was banned by the law. Burning of branches and wood residues on felling areas is allowed and practiced with great care. Planned fire is also banned on agricultural land.

9.2.3 Original data

For the period 1990-2001 only the number of forest fires is available, and some data on burned area in state owned forests. In 2002 a new data gathering method was established by the State Forest Service (SFS) and the Disaster Recovery Service (DRS)

In the new system the DRS delivers the location of fires to the SFS, who completes the data with burned area and forest stand information, based on the principles of complementarities and rationality. From beginning of 2007 this system contains other different data segments on forest fires (such as fuel type of burnt area, data of effected forest sub-compartment, mop-up measures and etc.)

NUMBER OF VEGETATION FIRES																	
FIRES	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
FOR	646	2452	1188	555	542	514	770	854	229	811	419	382	375	104	150	97	284
OWL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OTL	5433	1679	10252	10058	8323	7175	11682	18220	7960	20108	12512	19612	18209	10060	13133	7490	6407
TOTAL	6079	4131	11440	10613	8865	7689	12452	19074	8189	20919	12931	19994	18584	10164	13283	7587	6691

BURNED AREA OF VEGETATION FIRES (hectares)										
Vegetation fire	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
FOR	756	1595	n.a.	1226	1054	354	3530	625	3471	731
OWL	0	0	0	0	0	0	0	0	0	0
OTL	n.a.	16088	17271							
TOTAL	n.a.	19559	18002							

9.3 Analysis and processing of national data

9.3.1 Calibration

There is no need for calibration.

9.3.2 Estimation and forecasting

Wildfires (uncontrolled fires) in forests and other vegetation (wildland fires) in Hungary are predominantly caused by humans – about 95% of all known causes. Most fires are started by negligence, only a small part of fire incidents are caused by arsonists. Typical forest fire causes include carelessly abandoned camp fires and illicit agricultural fires.

Wildland fires in Hungary can be classified in five regimes typically characterized by the prevailing seasonality, vegetation type affected, fire size, fire characteristics and impacts.

The number of vegetation fires are correlated to weather conditions, fall and fire characterization. Climate change scenarios indicate that despite the efforts made, number of wildfires not likely to decrease in the future.

9.3.3 Reclassification into FRA 2010 categories

There is no need for reclassification.

9.4 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.	5105	n.a.	16221	n.a.	11261
... of which on forest	n.a.	1549	1.2	539	1.8	202
... of which on other wooded land	0	0	0	0	0	0
... of which on other land	n.a.	3556	n.a.	15682	16.1	11059

Table 9b

FRA 2010 category	Proportion of forest area affected by fire (%)		
	1990	2000	2005
Wildfire	100	100	100
Planned fire	0	0	0

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

Planned fire (like prescribed burning) was traditionally not a practice in Hungary and was banned by the law. Burning of branches and wood residues on felling areas is allowed and practiced with great care. Planned fire is also banned on agricultural land.

From 2008 the decree on protection of forests fires provides green light to use planned fire, but up to now it is not a practice in Hungary.

9.5 Comments to Table T9

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Area affected by fire and Number of fires	<p>The new data collecting system from 2007 allows all vegetation fires - that qualified as forest fires by EU definitions – to be recorded in the system. Data on vegetation fires outside forests were not collected in SFS Fire Information System before 2007.</p> <p>Data on vegetation fires outside forests were collected from DPRS database.</p> <p>Area of other land affected by fire in 2005 is outstandingly high as data was available only to 2007 an usually dry year with high fire season. The time series of forest fires (area affected) verify this hint!</p> <p>Data of FRA 2005 were revised and modified according to the best available information from the fire databases. Data on forest fires in FRA 2005 (especially affected area in 2000) were over estimated.</p>	<p>In relation to climatic alterations in different years the number and area of fires vary considerably.</p> <p>Hot and dry vegetation seasons experienced to be more frequent in the past decade, fire danger is increasing. Forest authorities and forest managers pay more attention to forest fires. Prevention, mitigation measures and fire statistics system was improved.</p>
Wildfire / planned fire	<p>From 2008 the decree on protection of forests fires provides green light to use planned fire, but up to now it is not a practice in Hungary. Planned fire was banned before 2008.</p>	

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 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
National Forest Stand Database	M	Area of sub-compartments, tree species	1976-2007	
Annual report on forest damages (forest damage database of the Hungarian Forest Research Institute)	M	Damage type, area	1962-2007	

10.2.2 Classification and definitions

National class	Definition
Disturbance by insects	For example: disturbances caused by Melolontha, bark louse, mealybug, woodborer, Cecidium, defoliator, shoot gnawer insects
Disturbance by diseases	For example: disturbances caused by Heterobasidium, Armillaria, Ganoderma, Phaeolus, Xanthochorus, Phellium, goiter, Dothichiza, Rhyacionia, Loranthus, defoliator fungi
Other biotic disturbances	For example: disturbance like wildlife browsing, grazing, physical damage by animals – game damage – and unknown categories.
Disturbance by abiotic factors	For example: disturbance like frost rib, trunk crack, exploitation, bark lesion, top drying, emissions, crown break, soil disturbances (erosion, inland water).

The detailed reference table is under 10. 3.3.

10.2.3 Original data

FRA Categories	Average annual area affected (1000 hectares)									
	Forests					Other wooded land				
	1988	1989	1990	1991	1992	1988	1989	1990	1991	1992
Disturbance by insects	40.0	118.4	62.6	39.7	70.4	0.0	0.0	0.0	0.0	0.0
Disturbance by diseases	4.1	43.8	20.5	22.1	15.5	0.0	0.0	0.0	0.0	0.0
Other biotic disturbance	7.0	25.5	31	37.8	29.4	0.0	0.0	0.0	0.0	0.0
Disturbance by abiotic factors	8.2	7.4	33.5	13.8	28.5	0.0	0.0	0.0	0.0	0.0

FRA Categories	Average annual area affected (1000 hectares)									
	Forests					Other wooded land				
	1998	1999	2000	2001	2002	1998	1999	2000	2001	2002
Disturbance by insects	50.2	68.1	60.3	69.8	74.5	0.0	0.0	0.0	0.0	0.0
Disturbance by diseases	20.9	22.7	14.9	20.5	22.1	0.0	0.0	0.0	0.0	0.0
Other biotic disturbance	19.8	23.4	25.3	23.7	26.6	0.0	0.0	0.0	0.0	0.0
Disturbance by abiotic factors	6.8	25.5	37.2	19.3	16.7	0.0	0.0	0.0	0.0	0.0

FRA Categories	Average annual area affected (1000 hectares)									
	Forests					Other wooded land				
	2003	2004	2005	2006	2007	2003	2004	2005	2006	2007
Disturbance by insects	129.4	215	283.6	109.5	38.2	0.0	0.0	0.0	0.0	0.0
Disturbance by diseases	13.8	41.6	41.2	16.1	11.1	0.0	0.0	0.0	0.0	0.0
Other biotic disturbance	40.4	32.3	35.1	39.9	30.0	0.0	0.0	0.0	0.0	0.0
Disturbance by abiotic factors	39.0	16.6	23.2	11.3	59.4	0.0	0.0	0.0	0.0	0.0

10.3 Analysis and processing of national data

10.3.1 Calibration

The law obligates the forest managers (above 100 ha forest area) to report the forest damages in every year to the Hungarian Forest Research Institute. This data supply covers about 70% of the total forest area. Linear extrapolation from the 70% to the 100% forest area was not applied considering the site conditions, species composition and management practice of the reported 70% and the remaining 30% may differ considerably.

10.3.2 Estimation and forecasting

No need for estimation and forecasting.

10.3.3 Reclassification into FRA 2010 categories

FRA 2010 category		Definition / Scientific name	Periods			
			1990	2000	2005	
Disturbance by insects	Root and collar insects	Melolontha spp. larva	X	X	X	
		Elateridae	X	X	X	
		Hylobius abietis	X	X	X	
	Sucking insects	Cryptococcus fagisuga	X	X	X	
		Kermes quercus	X	X	X	
		Phloeomyzus passerinii	X	X	X	
		Parthenolecanium corni	X	X	X	
		Aphididae	X	X	X	
		Phyllaphis fagi	X	X	X	
		Phylloxera quercina	-	X	X	
		Pentatoma rufipes	X	X	X	
		Woodborers	Scolytidae	X	X	X
			Pissodes notatus	X	X	X
			Cryptorrhynchus lapathi larva	X	X	X
	Cryptorrhynchus lapathi imago		X	X	X	
	Saperda carcharias		X	X	X	
	Sesia apiformis		X	X	X	
	Saperda populnea		X	X	X	
	Paranthrene tabaniformis		X	X	X	
	Agrilus suvorovi populneus		X	X	X	
	Agrilus viridis		-	-	X	
	Taphrorychus bicolor		-	-	X	
	Rhyacionia buoliana		X	X	X	
	Gall makers		Vasates robiniae	X	X	X
		Sacchiphantes spp.	X	X	X	
	Defoliators	Byctiscus spp.	-	-	X	
		Melasoma spp.	X	X	X	
		Melolontha spp. imago	X	X	X	
		Other cockchafer	X	X	X	
		Haltica quercetorum	X	X	X	
		Phyllobius spp.	X	X	X	
		Stereonychus fraxini	X	X	X	
		Peritelus familiaris	-	X	X	
		Lytta vesicatoria	-	X	X	
		Hyphantria cunea	X	X	X	
		Geometridae	X	X	X	
		Malacosoma neustria	X	X	X	
		Euproctis chrysorrhoea caterpillar-nest*	X	X	X	
		Euproctis chrysorrhoea caterpillar	X	X	X	
		Leucoma salicis	X	X	X	
		Lymantria dispar egg-batch*	X	X	X	
		Lymantria dispar	X	X	X	
		Agrotis segetum	X	X	X	
		Helicoverpa armigera	-	X	X	
		Nycteola asiatica	X	X	X	
	Clostera anastomosis	-	X	X		

		Ptilophora plumigera	-	X	X
		Thaumetopoea processionea	X	X	X
		Trotrix viridana	X	X	X
		Diprionidae	X	X	X
		Acantholyda hyperglyphica	-	X	X
		Lygaeonematus abietinus	X	X	X
	Leafminers	Rhynchaenus fagi	X	X	X
		Cameraria orhidella	-	-	X
		Parectopa robiniella	X	X	X
		Phyllonorycter robiniella	-	X	X
		Phyllocnictis suffusella	-	-	X
		Phyllocnictis xenia	-	-	X
		Tischeria ekebladella	X	X	X
	Acorn insects	Curculio spp.	X	X	X
Disturbance by diseases	Leafspot fungi	Apiognomonina errabunda	X	X	X
	Blight	Pinus nigra shoot-decline:	X	X	X
		(Sphaeropsis sapinea, Dothistroma pini, Scleromorhoma pithyophila)	-	-	-
	Root rot	Heterobasidion annosum	X	X	X
	Needle casts	Lophodermium seeditiosum	X	X	X
		Lophodermium pinastri	X	X	X
	Rust	Melampsora pinitorqua	X	X	X
		Melampsora spp.	X	X	X
	Powdery mildew	Microsphaera alphitoides	X	X	X
	Canker	Cryphonectria (Endotia) parasitica	X	X	X
		Cryptodiaporthe populea	X	X	X
		Diaporthe oncostoma	-	-	X
		Phytophthora sp.	-	X	X
Wilt	Ulmus decline	X	X	X	
Other fungi	Coniferous plant-decline	X	X	X	
Disturbance by other biotic agents	Game	Game damage - winter	X	X	X
		Game damage - summer	X	X	X
	Complex declines	Quercus petraea decline	X	X	X
		Quercus robur decline	X	X	X
		Fagus sylvatica decline	-	X	X
		Quercus cerris decline	-	X	X
		Coniferous decline	-	X	X
	Other tree species decline	X	X	X	
	Other biotic damage	Microtus arvalis and other rodent damage	X	X	X
		Castor fiber damage	-	-	X
	Parasitic plants	Viscum album	X	X	X
Loranthus europaeus		X	X	X	
Unknown damage	Unknown damage	X	X	X	
Disturbance caused by abiotic factors	Winter abiotic damage	Snow break	X	X	X
		Ice damage – winter	X	X	X
		Rime break	X	X	X
	Wind-throw, wind-break	Wind-throw, wind-break	X	X	X
	Drought damage	Drought damage	X	X	X
	Frost	Frost in nursery	X	X	X
		Frost in saplings	X	X	X

Summer ice damage	Ice damage – summer	X	X	X
Summer flood damage	Summer flood damage	X	X	X
Sand blast	Sand blast	X	X	X

* This data are not included in the “Disturbance caused by insects” from 2004 by the Hungarian method.

“-“ sign means: not collected data in the period.

10.4 Data for Table T10

Table 10a – Disturbances

FRA 2010 category	Affected forest area (1000 hectares)		
	1990	2000	2005
Disturbance by insects	66.2	64.6	155.2
Disturbance by diseases	21.2	20.2	24.7
Disturbance by other biotic agents	26.1	23.8	27.5
Disturbance caused by abiotic factors	18.3	21.1	29.9
Total area affected by disturbances	131.8	129.7	245.3

Notes: 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.

The total area affected by disturbances is not necessarily the sum of the individual disturbances as these may be overlapping.

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)
<i>Lymantria dispar</i> - egg-batch - caterpillar	<i>Quercus spp.</i> , and almost every broadleaf species	2003-2006	410.3 393.6	10-11
Scolytidae - <i>Ips typographus</i>	<i>Picea abies</i>	2004-2006	6.5	11-12

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)
<i>Acer negundo</i> – in shrub storey	12.6
<i>Acer negundo</i> – in stand storey	2.8
<i>Amorpha fruticosa</i> – in shrub storey	17.1
<i>Amorpha fruticosa</i> – in stand storey	-
<i>Fraxinus Americana</i> – in shrub storey	7
<i>Fraxinus Americana</i> – in stand storey	7.6
<i>Celtis occidentalis</i> – in shrub storey	3
<i>Celtis occidentalis</i> – in stand storey	1.6
<i>Ailanthus altissima</i> – in shrub storey	2
<i>Ailanthus altissima</i> – in stand storey	1.6
Total in shrub storey	41.7
Total in stand storey	13.6
Total forest area affected by woody invasive species	55.3

Note: The total forest area affected by woody invasive species is not necessary the sum of the values above as these may be overlapping.

Additional invasive species of importance :

<i>Padus serotina</i> – in shrub storey	1
<i>Padus serotina</i> – in stand storey	1.2

10.5 Comments to Table T10

Variable / category	Comments related to data, definitions, etc.	Comments on reported trend
Disturbance by insects	<i>Euproctis chryorrhoea</i> caterpillar-nest and <i>Lymantria dispar</i> egg-batch data not included into the "Disturbance caused by insects" from 2004 by the Hungarian method. * * * The original data provided in FRA 2005 are revised - Table 10a. The data source used is the forest damage database of Hungarian Forest Research Institute.	The high area reported is due to enormous attacks of <i>Lymantria dispar</i> 2004-2007.
Disturbance by diseases	The original data are revised - Table 10a. The data source from forest damage database of Hungarian Forest Research Institute.	
Disturbance by other biotic agents	There are significant changes in the original data ("Other disturbance"). The original data provided in FRA 2005 are revised - Table 10a. The revised data source from forest damage database of Hungarian Forest Research Institute.	
Disturbance caused by abiotic factors	There are significant changes in the original data ("Other disturbance"). The original data provided in FRA 2005 are revised - Table 10a. The revised data source from forest damage database of Hungarian Forest Research Institute.	Drought damage more frequent recently.
Major outbreaks	The "Area affected" sum up to the value of years.	
Invasive species	Hungarian database (inventory) register tree species within a sub-compartment in case the species composition is at least 5%. In separate file there are estimated data about shrub and those tree species where the mixture rate less than 5%. The areas are estimated values from our shrub database. The list does not include the <i>Robinia pseudoacacia</i> , because it is an economically important tree species in Hungarian forests and not considered to be harmful invasive forest species.	

Other general comments to the table

Areas classified as other sub-compartments as primary function (see T1) are not taken into account. Only the area of sub-compartment covered by forest is included.

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
Central Agricultural Office, Forestry Directorate (National Statistical Data Collection Program, OSAP 1257 and OSAP 1260)	H	Industrial roundwood, Woodfuel removal	All	Based on the net removals of the bigger forest managers (covering the appr. 70% of the total countrywide removals), extended to the whole country based on the total brut harvesting.
Central Agricultural Office, Forestry Directorate (National Statistical Data Collection Program, OSAP 1259)	H	Prices	All	Based on the bigger forest managers' data (covering the appr. 70% of the total countrywide removals).

11.2.2 Classification and definitions

National class	Definition
Industrial roundwood	Volume of roundwood <i>under</i> bark.
Woodfuel	Same as FRA category.

11.2.3 Original data

FRA 2010 Category	Industrial roundwood removals			Woodfuel removals		
	1990	2000	2005	1990	2000	2005
Volume (1000 m ³ o.b.)	3512	3305	2804	2433	2597	3136
Unit value (local currency / m ³)	3165	9960	11254	1100	4946	7330

Original data collected before overbark-underbark conversion. Full exploitation, so data refer to the total forest area.

Year	Industrial roundwood removals (1000 m ³)	Woodfuel removals (1000 m ³)
1988	3581,5	2818,9
1989	3882,0	2621,0
1990	3512,4	2433,0
1991	3208,6	2583,2

1992	2719,3	2618,7
1993	2269,0	2229,7
1994	2262,7	2134,1
1995	2336,1	1994,8
1996	2259,3	1846,9
1997	2341,9	1908,8
1998	2406,7	1753,0
1999	2644,5	1980,6
2000	2557,9	1865,8
2001	2422,0	1692,4
2002	2462,0	1824,3
2003	3003,5	2780,8
2004	2988,0	2672,1
2005	2803,6	3136,4
2006	2666,9	3245,9
2007	2761,2	2878,7

11.3 Analysis and processing of national data

11.3.1 Calibration

Calculation of over bark volume of industrial roundwood: national bark-conversion factors from literature.

Species	Bark %	Conversion factors
Oak	19.8	1,247
Turkish oak	21.0	1.266
Beech	10.0	1.111
Hornbeam	10.0	1.111
Black locust	20.0	1.250
Other hard broadleaves	17.0	1.205
Poplar and willow	18.0	1.219
Other soft broadleaves	18.0	1.219
Coniferous	20.0	1.250

Hungarian standards are over bark in case of wood fuel and under bark for industrial wood.

11.3.2 Estimation and forecasting

Forecasting is not needed as data were available.

Data for wood removals are available only for the main producers covering about 70% of the total removals. To get the country specific figures for the assortments it was assumed that the same percentage of the different assortment produced by the small forest owners so the percentage of the specific assortments for the big producers was extended to the country total wood removal.

11.3.3 Reclassification into FRA 2010 categories

	Industrial wood removal	Woodfuel removal
Industrial roundwood	100 %	
Woodfuel		100 %

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.)	4129	3860	3452	2615	2322	2943
... of which from forest	4129	3860	3452	2615	2322	2943
Unit value (local currency / m ³ o.b.)	3165	9960	11254	1100	4946	7330
Total value (1000 local currency)	1306828 5	3844560 0	3884880 8	2876500	11484612	21572190

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	Forint (HUF)	Forint (HUF)	Forint (HUF)

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	No data available on woodfuel removals out of forest. But its quantity is negligible.	
Unit value	Prices are without value added taxes.	
Total value		

Other general comments to the table
<p>Differs from JFSQ and FRA 2005 in volume because of two reasons:</p> <ul style="list-style-type: none"> – the underbark-overbark conversion of industrial roundwood – the 5 years average calculation.

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

No information 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 <u>wage or salary</u> in cash or in kind.
Self-employment	Persons who during a specified reference period performed some work for <u>profit or family gain</u> 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 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
AKII (Agricultural Economics Research Institute)	M	Paid employments	1990	paid employments (Labourer, White collar workers)
OSAP (National Statistical Data Collection Programme)	M	Paid employers	2000, 2005	paid employments (Labourer, White collar workers)

13.2.2 Original data

FRA 2010 Category	Employment (1000 years FTE)		
	1990	2000	2005
Employment in primary production of goods	37.21	32.66	31.30
...of which paid employment	36.71	9.46	6.92
...of which self-employment	0.50	23.20	24.11
Employment in management of protected areas	1.17	5.14	5.37

13.3 Analysis and processing of national data

13.3.1 Reclassification into FRA 2010 categories

Paid employment: employees of state owned forest companies,
Self-employment: entrepreneurs, contractors

13.4 Data for Table T13

FRA 2010 Category	Employment (1000 years FTE)		
	1990	2000	2005
Employment in primary production of goods	37	32	31
...of which paid employment	36	9	7
...of which self-employment	1	23	24
Employment in management of protected areas	1	5	5

13.5 Comments to Table T13

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Employment in primary production of goods		Declining employment in the sector is related to the restitution and economical restructuring.
Paid employment / self-employment	Paid employment: state owned forest companies, Self employment: estimated data.	After the restitution in the nineties the structure of employment has been considerably changed.
Employment in management of protected areas	Area-proportional estimated data. Protected areas also available for timber production.	Mainly related to the increase of protected areas.

Other general comments to the table

Unlike FRA 2005, employment of primary wood industry not included.

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		Yes	
	X	No	
If Yes above, provide:	Year of endorsement		
	Reference to document		
National forest programme (nfp)	X	Yes	
		No	
If Yes above, provide:	Name of nfp in country	Nemzeti Erdőprogram (National Forest Program)	
	Starting year	2006.	
	Current status		In formulation
		X	In implementation
			Under revision
Reference to document or web site	1110/2004 (X. 27.) Korm. határozat (Government decree) http://www.fvm.hu/main.php?folderID=1481&articleID=5850&ctag=articlelist&iid=1		
Law (Act or Code) on forest with national scope	X	Yes, specific forest law exists	
		Yes, but rules on forests are incorporated in other (broader) legislation	
		No, forest issues are not regulated by national legislation	
If Yes above, provide:	Year of enactment	2009	
	Year of latest amendment	-	
	Reference to document	2009. évi XXXVII. törvény az erdőről és az erdő védelméről (Act on forests, forest management and on the protection of forests)	

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	
National forest programme (nfp)	Implementation of the program was delayed by 2 years and started officially in 2008.
Law (Act or Code) on forest with national scope	The new forest act was approved by the Parliament in April 2009.
Sub-national forest policy statements	
Sub-national Laws (Acts or Codes) on forest	

Other general comments to the table

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 3 years of post secondary education.

15.2 Data for Table T15

Table 15a – Institutions

FRA 2010 Category	2008	
Minister responsible for forest policy formulation : please provide full title	Minister of Agriculture and Rural Development	
Level of subordination of Head of Forestry within the Ministry		1 st level subordination to Minister
		2 nd level subordination to Minister
	X	3 rd level subordination to Minister
		4 th or lower level subordination to Minister
Other public forest agencies at national level	Central Agriculture Office, Forestry Directorate	
Institution(s) responsible for forest law enforcement	Central Agriculture Office, Forestry Directorate	

Table 15b – Human resources

FRA 2010 Category	Human resources within public forest institutions					
	2000		2005		2008	
	Number	%Female	Number	%Female	Number	%Female
Total staff	563	30,4	531	29,0	418	23,2
...of which with university degree or equivalent	416	16,6	399	15,5	348	14,9

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	The minister of agriculture is traditionally responsible for forestry in Hungary.	
Level of subordination of Head of Forestry within the Ministry		
Other public forest agencies at national level		
Institution(s) responsible for forest law enforcement	In 2000 and 2005 the State Forest Service, in 2008 the Central Agriculture Office Forestry Directorate.	
Human resources within public forest institutions	Data on 2000 and 2005 refer to the State Forest Service (SFC) responsible for forest law enforcement. In 2006 the SFC was integrated into the newly established Central Agriculture Office and within the organisation the Forestry Directorate is responsible for forestry issues.	

Other general comments to the table

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 8 years.
Master's degree (MSc) or equivalent	University (or equivalent) education with a total duration of about five years.
Bachelor's degree (BSc) or equivalent	University (or equivalent) education with a duration of about three 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 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
University of West Hungary, Forestry Faculty	H	graduated students in forestry, researchers	2000, 2005, 2008	There is only one faculty of forestry in Hungary, the level of education was MSc, therefore there is no BSc level graduation in the relevant years. Only forest engineers are reported as graduated students, (Engineers in timber industry, environment protection, hunting etc. also educated at the University with special focus on forestry are not reported.) The numbers of graduated students are based on the official records of the University. Calculation of the number of researchers in the University is described in 16.3
University of West Hungary, Forestry Technical School	H	Technical certificate in forestry	2000, 2005, 2008	There are 3 specialised schools in Hungary, the number of graduates was summarised by the technical school of the University of West Hungary based on the official records of the schools.
Forest Research Institute	H	researchers	2000, 2005, 2008	

16.2.2 Original data

No special national data table for education.

Research:

There are two main organisations specialised to forest research in Hungary:

Forest Research Institute,

University of West Hungary, Forestry Faculty

Forest related research also appears in other research and education institutes but in line with the specifications only the two main forest oriented research institutes are included.

Forest Research Institute

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)	9	1	14	4	13	3
Master's degree (MSc) or equivalent	17	7	17	6	15	4
Bachelor's degree (BSc) or equivalent	2	0	2	1	1	1

University of West Hungary, Forestry Faculty

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)	14	4	14	4	14	4
Master's degree (MSc) or equivalent	23	6	30	10	27	8
Bachelor's degree (BSc) or equivalent	0	0	0	0	0	0

16.3 Analysis and processing of national data

Education table was directly filled, no special calculation was applied.

Research:

There was no special data processing of the data referring to Forest Research Institute.

In case of the University, where research and education is also implemented by the same staff, the following principles were agreed:

In case of the staff devoted primarily to education, based on the guiding principles of the Forestry Faculty, 30% of the working time should be research therefore the total number of staff for education was recalculated accordingly.

In case the staff devoted primarily to research, based on the guiding principles of the Forestry Faculty, 80% of the working time should be research therefore the total number of staff for research was recalculated accordingly.

In table 16.2.2 the recalculated, final numbers are shown.

16.4 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	43	13,1 %	37	8,1 %	29	20,1 %
Bachelor's degree (BSc) or equivalent	-	-	-	-	-	-
Forest technician certificate / diploma	156	0,6 %	154	4,5 %	144	3,5 %
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)	23	22%	28	29%	27	26%
Master's degree (MSc) or equivalent	40	33%	47	34%	42	29%
Bachelor's degree (BSc) or equivalent	2	0%	2	50%	1	100%

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.

16.5 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 is a slight decrease in graduated foresters related to the ongoing staff reductions in the forest administration and in the state owned forest enterprises.
Professionals working in public forest research centres		Though the number of researchers does not seem to decrease, there was a dramatic decrease in the support staff (technicians, assistants) in forest research and the number of researchers is likely to decrease in the near future.

Other general comments to the table

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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
State Assets Management Portfolio, Forestry Section	H	Forest revenues: rent for state owned forests	2000, 2005	
Central Agriculture Office, Forest Directorate	H	Forest revenues: stumpage price and	2000, 2005	
Forest Research Institute	H	Operational expenditure	2000, 2005	
University of West-Hungary, Forestry Faculty	H	Operational expenditure	2000, 2005	
Ministry of Environment Protection and Water	M	Operational expenditure	2000, 2005	
Central Agriculture Office, Forestry Directorate	H	Operational expenditure	2000, 2005	
Central Agriculture Office, Forestry Directorate	H	Transfer payments	2000, 2005	

17.2.2 Classification and definitions

There is no complete data available on forest revenues as defined in FRA, only some elements could be collected that can be finally rather misleading when the revenues and expenditures are compared.

National class	Definition
Renting fee for state owned forests (revenue)	Organisations managing the state owned forest land have to pay a modest renting fee to the state. Majority of the state owned forests are managed by the forest companies owned by the state. The rent paid by the companies is indicated in the tables as they represent close to the full state revenue from renting forest area.
Stumpage price and fines (revenue)	Stumpage price to all forests paid after felling to the state budget (fund to support reforestations through transfer payments) and fines paid by the forest managers to the authority for non compliance with the forest act.
Administrative fees (revenue)	Administrative fees paid by the forest managers to the authorities.
Operational expenditures	The same as in FRA categories.
Transfer payments	The same as in FRA categories.

17.2.3 Original data

FRA 2010 Categories	Revenues (1000 local currency)	
	2000	2005
Renting fee for state owned forests	67400	67400
Stumpage price and fines	4545000	3684035
Administrative fees	111558	267628
Forest revenue	4723958	4019063

Only revenues registered by the forest administration are included.

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						
Forest Research Institute	335269	321922	99584	39507	434853	361429
University of West-Hungary, Forestry Faculty	202936	263990	188955	270531	391891	534521
National parks, nature conservation authorities	300000	350000	0	70000	300000	420000
Central Agriculture Office, Forestry Directorate	2614901	3570988	0	347406	2614901	3918394
Total operational expenditures	3453106	4506900	288539	727444	3741645	5234344
Transfer payments	4021000	9918889 ¹⁾	0	2869341	4021000	12788230

1) The amount is extremely high as the payments of 2004 were also shifted to 2005, that means transfer payments for 2 years are corresponded in 2005.

Only transfer payments registered by the forest administration are included.

17.3 Analysis and processing of national data

17.3.1 Calibration

State Revenue – rent for state owned forests: Majority of the state owned forests are managed by the forest companies owned by the state. The rent paid by the companies is indicated in the table as it represents close to the full state revenue from renting forest area. No recalculation was used.

17.3.2 Estimation and forecasting

In case of forest revenues only data available in forest administration was considered. It is assumed that state revenue from forestry sector is considerably higher, however additional types of revenues, especially taxes related to wood products are not available and due to the high uncertainty, estimation was not applied.

17.3.3 Reclassification into FRA 2010 categories

No reclassification.

17.4 Data for Table T17

Table 17a - Forest revenues

FRA 2010 Categories	Revenues (1000 local currency)	
	2000	2005
Forest revenue	4723958	4019063

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	3453106	4506900	288539	727444	3741645	5234344
Transfer payments	4021000	9918889	0	2869341	4021000	12788230
Total public expenditure	7474106	14425789	288539	3596785	7762645	18022574
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 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 type="checkbox"/>	Other, specify below				

17.5 Comments to Table T17

Variable / category	Comments related to data, definitions, etc.	Comments on the reported trend
Forest revenue	<p>Only revenues registered by the forest administration are included.</p> <p>It is assumed, that state revenue from forestry sector is considerably higher, however additional types of revenues, especially taxes related to wood products are not available and due to the high uncertainty, estimation was not applied.</p>	
Operational expenditure		<p>Increase of external funding in 2005 is related to the EU membership (1. 4. 2004) support provided for the state administration through different projects.</p>
Transfer payments	<p>Only transfer payments registered by the forest administration are included. Additional payments (like payments for environment protection, etc.) were not available.</p> <p>The amount is extremely high as the payments of 2004 were also shifted to 2005, that means transfer payments for 2 years are corresponded in 2005.</p>	<p>External funding in 2005 is related to the EU membership (1. 4. 2004) to the EU support provided for afforestations.</p>

Other general comments to the table