

INFORMATION
on Forests and Forestry
in the Czech Republic
by **2009**



MINISTRY OF AGRICULTURE
OF THE CZECH REPUBLIC

Ministry of Agriculture of the Czech Republic, Forestry Section



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I. GENERAL MACROECONOMIC CONDITIONS IN THE CZECH REPUBLIC AND FORESTRY POSITION IN NATIONAL ECONOMY

I.1 Macroeconomic Conditions in the Czech Republic

Economic growth

In 2009, the Czech Republic was hit hard by economic recession. This meant the worst economic growth in the entire existence of the Czech Republic from 1993. GDP noted a year-on-year drop along with a fall of constant prices, which declined by 4.1%. The decline was still not steeper in the country than the average in the EU 27 or the euro area (16 states).

According to the Eurostat preliminary data, in 2009, the Czech Republic reached on average 80.0% of the volume index of GDP per capita in the purchasing power parity for the EU 27. The ratio represents 54.4% when converted at the current rate.

Trade balance represented a positive value in 2009 resulting in a surplus of CZK 180.6 billion, with a year-on-year increase by CZK 77.9 billion. Both import and export experienced a year-on-year decline, by CZK 420 billion and CZK 342 billion respectively.

Macroeconomic indices of national economy¹⁾

Index	Unit	2008	2009
GDP in current prices	billion CZK	3 689.0	3 627.2
	year-on-year index	104.3	98.3
GDP in constant prices 2000	year-on-year index	102.5	95.8
	EU 15 = 100	72.6	72.1
Average monthly earnings ³⁾	CZK	22 691	23 598
	year-on-year index	108.3	104.0
Average inflation rate	%	6.3	1.0
General unemployment rate (average)	%	4.4	6.7
Population	1 000	10 429.7	10 506.8
Parity (mean) - CZK/EUR - CZK/USD	CZK	24.942	26.445
	CZK	17.035	19.057

Source: Czech Statistical Office, Czech National Bank, Eurostat.

Notes:

- 1) Data published by 8 April 2010.
- 2) Rate by purchasing power parity; based on the results of the European Comparison Programme and OECD estimates, not final result for 2009.
- 3) Average monthly gross nominal wages on full-time equivalent number of employees in the national economy.

Compared to 2008, the general unemployment rate increased by 2.3% and reached 6.7%. Despite this fact, the average unemployment rate in the Czech Republic remains under the average of all EU member states (8.9%) and the euro area (9.4%). Average gross nominal wages were CZK 23 598 and represented a year-on-year increase by 4.0%. With the inflation rate of 1.0%, the real wages increased by 3.0%.

I.2 Forestry Position in National Economy

The current economic and financial crisis also had an impact on the Czech forest-based industry. The demand for timber and paper products declined due to lower prices and reduced incomes, a number of wood-processing companies being closed down, staff reduction, and cut budgets.

The forest sector shows a great potential to contribute to “greener” economy and sustainable development mainly by providing timber for construction purposes, energy, and environmental services.

Green economy is understood as a process of restructuring business and infrastructure with a view to providing higher income based on natural, human and economic capital investment while reducing greenhouse gas emissions, exploitation of natural resources, the volumes of waste, and minimising social differences.

The forest-based sector may significantly contribute to reaching the targets of green economy and to integrating policies related to climate change mainly by reducing GHG emissions and enhancing the objectives concerning renewable energy.

There are three main categories where the forest-based sector can contribute:

- biomass energy
- green infrastructure and building industry related to forest products
- role of forest resources in carbon reduction.

Forest residues currently represent the most significant source of biomass energy in most countries and its importance will also grow in the Czech Republic. This is an increasing opportunity to make the maximum use of timber.

Increased utilisation of natural material (forest residues) in infrastructure and building industry is seen as a positive contribution to climate change mitigation. It can minimise the use of unrenovable sources of energy. Natural materials have an advantage of fixing carbon during their lifetime.

The objectives of climate change mitigation recognise the potential of forests to reduce carbon. For this reason, forest protection and, if possible, further afforestation are indispensable.

Share of agriculture ¹⁾, forestry ²⁾, fishery ³⁾ and food industry ⁴⁾ on the GDP in basic prices (%)

Year	Agriculture	Forestry	Fishery	Food industry
Current prices				
2000	2.99	0.87	0.030	3.50
2005	2.27	0.74	0.022	3.03
2006	1.88	0.70	0.020	2.75
2007	1.78	0.67	0.014	2.43
2008	1.93	0.60	0.011	2.53
2009	1.65	0.62	0.015	2.72
Constant prices 2000				
2000	2.99	0.87	0.030	3.50
2005	2.88	1.19	0.029	2.55
2006	2.17	1.04	0.030	2.57
2007	1.77	0.92	0.021	2.22
2008	1.73	1.03	0.019	2.38
2009	3.02	1.02	0.019	2.15

Source: Czech Statistical Office.

Notes:

- 1) Including game management and related activities.
- 2) Including related activities.
- 3) Including fish farming and related activities.
- 4) Production of food and drinkables, and tobacco products.

Sustainable forest management serves as an instrument of the forest sector in the process of adapting to climate change. Forests have a number of positive external effects (for example in the protection of water resources) and other many environmental services.

1.2 Forest Ownership Structure in the Czech Republic

As was the case in 2008, the year 2009 neither brought any significant changes in the structure of forest land ownership.

Most forests in the country, i.e. slightly over 50% are state forests managed by LČR, s.p. Large forest areas are also managed by private entities, municipalities, and towns. Other forest owners do not represent a significant share. No substantial changes in ownership have occurred in the recent years. Worth mentioning is a slow and gradual decline in forests owned by state, mainly due to the reduced forest area under LČR, s.p. management.

The forest area managed by VLS ČR, s.p., national parks, and AOPK ČR remains stable. AOPK ČR gradually secures forest management plans for the mentioned forests in individual regions. The trend of a slow reduction of forests managed by cooperatives and associations ceased.

The restitution process has practically finished with some exceptions. In some of the legally complicated cases, courts still decide on restitution claims in or outside an appellate procedure.

Forest ownership structure in the Czech Republic - 2009

Ownership	Area of forest stands		
	(ha)	%	
State forests	1 564 538	60.32	
Of which	LČR s.p.	1 313 762	50.65
	VLS ČR, s.p.	123 855	4.77
	Ministry of the Environment (National Parks)	94 853	3.66
	Regional forests (secondary schools and other)	3 796	0.15
	Other	22 449	0.87
	Ministry of the Environment (AOPK ČR)	1 178	0.05
	Originally state forests (**)	4 645	0.18
Legal persons	67 577	2.61	
Municipalities and towns	425 143	16.39	
Church and other religious entities	1 679	0.06	
Forest cooperatives and associations	30 619	1.18	
Forests owned by individuals	504 368	19.44	
Other (not listed) forests	0	0.00	
TOTAL	2 593 923	100.00	

Source: Forest Management Institute.

** Original large FMPs owned by state – valid from 1981 – from 1996, partly valid from 1997, private owners and municipalities manage them under an abstract from FMP. New FMPs will be available after their renewal.



80

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2. LEGISLATIVE ACTIVITIES RELATED TO FORESTRY, GAME MANAGEMENT, FISHERY AND BEEKEEPING, AND FORESTRY POLICY

2.1 Legislative Activities Related to Forestry, Game Management, Fishery and Beekeeping

Amendments of the following acts were adopted in the course of 2009:

- Act No. 289/1995 Coll., on forests and amendments to some legal regulations (Forest Act), as amended,
- Act No. 149/2003 Coll., on introducing the reproductive material of forest woody plants of important species and artificial hybrids intended for forest regeneration and reforestation, and on amendments to some relating acts (Act on Trade in the Reproductive Material of Forest Woody Plants), as amended.

The amendments were:

- Act No. 223/2009 Coll., amending some acts relating to the adoption of Act on free movement of services, which took effect on 28 December 2009,
- Act No. 227/2009 Coll., amending some acts relating to the adoption of Act on basic registers, which shall take effect on 1 July 2010,
- Act No. 281/2009 Coll., amending some acts relating to the adoption of the code on taxes, which shall become effective on 1 January 2011.

In 2009, Government Decree No. 247/2009 on initiation of forest inventory was adopted. Effective since 1 January 2010, it declares forest inventory for the period from 2010 to 2015.

In fishery legislation, negotiations were held in the course of 2009 concerning an executive regulation to implement Act No. 99/2004 Coll. on fish farming, the exercising of fishing rights, fishing wardens and the protection of marine fishing stocks and on the amendment of certain acts (Act on Fishery).

With respect to the eel recovery plans relating only to some areas in the catchment areas of the Labe and Odra Rivers and other parts of the country, a minimum landing size of 55 cm was laid down for this species, with a partly postponed effect from 2011.

2.2 National Forest Programme II

National Forest Programme II, approved by Government Resolution No. 1221 of 1 October 2008, is a conceptual document setting the grounds for the implementation of the principles of sustainable forest management while enhancing the competitiveness of forest management with a long-term perspective.

It is a fundamental document of the national forest policy, which also helps implement the EU Forestry Strategy and the related EU Forest Action Plan.

The Forest Management Institute takes the responsibility for the coordination of the entire implementation of NFP II and for the organisational and administrative tasks of the coordination board and individual expert groups. The coordination board meets on monthly basis. Its first meeting was held on 4 February 2009.

An expert group is set up for each of the 17 key actions to draw up an implementation project for the practical purposes of the given key action. Most of the implementation projects are expected to be finalised and negotiated in the course of 2010.





3. FOREST SECTOR OVERVIEW

3.1 Sources of Forest Reproductive Material

3.1.1 Registered Sources of Forest Reproductive Material

The central register of approved sources of forest reproductive material in the Czech Republic is managed by an authorized person (Forest Management Institute), which keeps the Register of Approved Sources Reproductive Material. For each approved unit, the Institute registers the tree species, category of reproductive material, type of source, registration number, location, altitude or altitudinal zone, area, origin, and, in case of tested reproductive material, also information whether the organism is genetically modified or not.

The Register of Approved Sources of Reproductive Material is accessible for public on the Internet pages www.uhul.cz in application called ERMA.

Identified sources of reproductive material

The category of 'identified source of reproductive material' represents the lowest qualitative selection.

As 'identified sources of reproductive material' are approved sources of seed or stands ranked in the phenotype category C. Stands of phenotype category A or B may also be approved as 'identified sources of reproductive material' in case they have not been approved as 'selected' or 'tested sources of reproductive material'.

As at 15 December 2009, 62 887.70 ha of reduced source area were registered in 6 176 approved units of type 'stand' and 281 units of type 'seed source'. Against 2008, this represents an increase by 11.97% in source type 'stand' with an enlarged tree species area by 4.06%, and an increase in type 'seed source' by 15.16%.

Selected sources of reproductive material

'Selected source of reproductive material' is the most widespread and utilised source of seed in forest regeneration.

Only phenotype categories A and B showing the required genetic and morphologic quality, location, area, age, structure, health condition, and a suitable habitat may be approved as 'selected source of reproductive material'.

As at 15 December 2009, 90 899.90 ha of reduced tree species area of source type 'stand' were registered in 9 085 approved units. Both phenotype categories noted an increase compared to the preceding year; phenotype category A by 4.85% and phenotype category B by 6.33%, reaching 11 227.50 ha and 79 672.40 ha respectively.

3.1.2 Forest Seed Management

Seed production

Seed production in the year 2009 was based on a standard harvest in all significant forest tree species, which corresponded the average annual consumption of seed material in forest management.

Production of seed material

Unit	Kg		
	Year	2008	2009
Norway spruce	13 833.6	71 554.6	46 000
Scots pine	94 802.4	38 525.0	40 000
Silver fir	52 236.4	58 491.9	65 000
European beech	55 745.4	74 102.2	56 000
Sessile oak	29 008.0	300 835.5	212 000

Source: Forest Management Institute.

The seed production plant in Týniště nad Orlicí processed 83 tons of seed material of 23 different forest tree species in 2009.

The named facility also stratified three tons of seed, mainly of beech, fir, and lime.

Spruce stands are still affected by the spruce needle miner, spruce seed moth, and spruce tap knocking beetle. The extent and impacts of the damage are dealt with in cooperation with the forest protection service.

Seed and raw seed material stock at the seed production plant in Týniště nad Orlicí

Species	Pure seed	Raw seed material
	kg	
Norway spruce	8 329	5 323
Scots pine	2 915	500
European larch	767	879
Silver fir	5 708	0
European beech	16 791	5 764

Forests of the Czech Republic, State Enterprise



3.1.3 Forest Nursery Management

Licence is the basic precondition for handling with forest reproductive material (FRM).

As at 31 December 2009, the central register of seed suppliers of the Ministry of Agriculture listed total 587 licence holders, i.e. 317 individuals and 270 legal persons. Compared to the previous year, there was a drop in the number of licences for handling with forest reproductive material.

Based on the data provided by licence holders to the authorized person (FMI), we may state that 263 individuals and legal persons were involved in nursery management in 2009, i.e. 32 entities fewer than in 2008.

At the end of the year, the total area of nurseries selling forest reproductive material was 1 794.58 ha, of which the production area amounted to 1 379.78 ha. In addition to the outside areas, there were 2.97 ha of greenhouses, 18.61 ha of plastic greenhouses and 21.69 ha of hotbeds. The recent trend shows a slight decrease in the total size of production areas of nurseries.

Under Act No. 149/2003 Coll., as amended, the control and supervision of handling forest reproductive material is the responsibility of the public administration bodies and the 'authorised person', which is, since 13 December 2005, the Forest Management Institute in Brandýs nad Labem.



Area of forest nurseries dealing with forest reproductive material

Year	2004		2009		
	Unit	ha	%	ha	%
Total area of forest nurseries		1 914,0		1 795,0	
Total production area of forest nurseries		1 428,0	100,0	1 371,0	100,0
Of which					
Outside area		1 394,0	97,6	1 328,0	96,8
Greenhouses		3,6	0,4	3,0	0,2
Plastic greenhouses		17,3	1,2	18,6	1,4
Hotbeds		12,3	0,8	21,7	1,6

Source: Forest Management Institute.

In the sector of nursery management and trade with forest reproductive material, the authorised person (FMI) carried out total 51 inspections of suppliers of forest reproductive material according to sec. 31(I) of Act No. 149/2003 Coll.

The quality of forest reproductive material underwent systemic improvement in the past years, which is continuously reflected in better artificial forest regeneration.

3.2 Forest Regeneration and Reforestation

The area of regenerated forest stands increased by approximately 2 088 ha compared to the previous year. This was a result of reforestation following extensive salvage cutting carried out in the previous years. The area of artificial reforestation increased in this respect, namely by 1 012 ha against 2008. A significantly low increase in natural regeneration contributed to the fact. Natural regeneration was 17.9% higher compared to 14.9% in 2008. The amount of unsuccessful reforestation has remained at the same level for several years, i.e. nearly 15%.

The species composition applied in artificial forest regeneration may be considered as quite favourable.

The share of broadleaves in reforestation reached 38.8% of total artificial reforestation, which still means a certain improvement against the previous year.

Forest regeneration (ha)

Method of regeneration	2000	2002	2004	2006	2008	2009
Artificial	21 867	18 120	19 042	18 445	19 888	20 900
Of which replating	4 371	3 212	2 766	3 054	3 089	3 011
Natural	3 422	2 941	3 401	3 417	3 487	4 563
Total	25 309	21 061	22 443	21 862	23 375	25 463

Source: Czech Statistical Office, FMI.

Artificial regeneration by tree species

Artificial regeneration		2000	2002	2004	2006	2008	2009
		ha					
*Total		21 867	18 120	19 042	18 445	19 888	20 900
Of which	Planting	21 486	17 676	18 733	18 257	19 793	20 782
	Sawing	381	444	309	188	95	118
	Spruce	9 479	7 941	8 495	7 954	8 567	9 162
	Fir	895	923	1 032	949	1 268	1 314
	Pine	2 597	2 267	2 361	2 437	2 141	1 955
	Larch	739	417	327	217	263	234
Of which	Other conifers	200	182	124	143	143	130
	Total conifers	13 910	11 730	12 339	11 700	12 382	12 795
	Oak	2 428	1 780	1 965	2 005	2 246	2 473
	Beech	3 386	3 143	3 406	3 433	3 865	4 316
	Lime	397	264	237	260	251	218
	Poplar, aspen	46	61	50	53	53	22
	Other broadleaves	1 700	1 142	1 045	994	1 091	1 076
	Total broadleaves	7 957	6 390	6 703	6 745	7 506	8 105
	% broadleaves	36.4	35.3	35.2	36.6	37.7	38.8

Note: *Including underplanting.
Source: Czech Statistical Office.

3.3 Cleaning and Thinning

The total extent of juvenile thinning remains at the level of recent years, i.e. 40 000 ha.

The extent of thinning increased up to 85 000 ha returning to figures seen before 2007, i.e. before the period of destructive disasters which resulted in a certain decrease in the volumes of advance felling.

Cleaning and thinning (1 000 ha)

Year	Cleaning	Thinning	Total
2000	47.7	115.5	163.2
2001	49.7	131.1	180.8
2002	34.9	103.2	138.1
2003	41.2	79.3	120.5
2004	43.4	91.1	134.5
2005	40.7	92.3	133
2006	39.7	83.7	123.4
2007	37.8	53.4	91.2
2008	42.8	66.7	109.5
2009	40.6	85.2	125.8

Source: Czech Statistical Office, Forest Management Institute.



3.4 Timber Harvest

Total 15.5 million m³ of timber were harvested in the Czech Republic in 2009. This is an average annual harvest in this decade, except the last few years, when the total volume of timber harvest was influenced by extensive salvage cutting.

Total annual timber harvest

Harvest	Unit	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Conifers	million m ³	12.85	12.68	13.01	13.66	13.92	13.88	16.12	17.28	14.88	14.05
Broadleaves		1.59	1.69	1.53	1.48	1.68	1.63	1.56	1.23	1.31	1.46
Total		14.44	14.37	14.54	15.14	15.60	15.51	17.68	18.51	16.19	15.50
Per capita	m ³	1.41	1.41	1.43	1.48	1.53	1.52	1.72	1.79	1.55	1.48
Per 1 ha of forest		5.48	5.45	5.50	5.73	5.90	5.86	6.67	6.98	6.10	5.84

Note: Volumes are given in m³ under bark, minimum top diameter 7 cm.

Source: Czech Statistical Office.

The total annual timber harvest is also partly driven by the conditions on the timber market. Despite a certain revival of the market, the already fading impact of the sales crisis was still noticeable.

The proportion of planned harvest and salvage cutting was somehow more favourable than in previous years. The share of salvage cutting in the total timber harvest reached 42.8% in 2009. The conditions for planned forest management were thus friendlier than in the preceding years.

3.5 Forest Protection

From the point of view of forest protection, the year 2009 may be considered as less favourable. Nevertheless, the overall situation was still better than in 2007 and 2008, when forests were seriously affected by abiotic factors (wind). The main damaging factors did not change. Among abiotic factors, most damage was caused by wind and snow whereas woodborers represented the most severe biotic factor. The weather conditions were quite balanced. Extreme weather effects (summer windstorms accompanied by rainstorms, wet snow in the beginning of winter) rather had a local character and had no impact on vast areas as was the case in the preceding two years. The total volume of salvage cutting was 6.63 million m³, i.e. significantly less than in 2008, when 10.75 million m³ were harvested this way.

Compared to the year 2008, the overall damage caused by abiotic factors dropped approximately by a third. A low occurrence of damaging biotic factors prevailed (particularly leaf-eating insects and most fungal pathogens). However, the situation regarding wood borers on spruce (mainly bark beetle) got worse and chronic problems related to excessive stocks of hoofed game pertained.

3.5.1 Preventive and Protection Measures

Extensive annual monitoring of forest damaging agents was also carried out in 2008. In accordance with Decree of the Ministry of Agriculture No. 101/1996 Coll., setting forth details for securing forest protection, as amended, the monitoring mainly focused on insect pests.

The main task was to monitor outbreak pests, in particular such as the spruce bark beetle (*Ips typographus*) and the black arches moth (*Lymantria monacha*). According to the recorded data, monitoring of insect pests was carried out

on a total area of approximately 140 thousand ha. Around 84 thousand traps were installed and 600 thousand m³ of trap trees were laid for monitoring of the bark beetle (i.e. more than a double as opposed to 2008, when approximately 277 thousand m³ of trap trees were laid). The black arches moth was monitored on more than 95 thousand ha of forest land.

Thanks to preventive and protection measures, the imminent danger in forest protection was averted in time in most cases and subsequent protection measures were adopted. The amount of protection measures related to woodborers, namely the spruce bark beetle, considerably increased when compared to 2008.

3.5.2 Protection against Damaging Factors

Substantial financial means are spent each year to avoid damage caused to forest stands by biotic factors in Czech conditions. These funds are particularly allocated to the following sectors: control of damage caused by game and rodents; control of undesirable vegetation in nurseries, stands and plantations; control of insect pests and fungal disease agents. A system of interrelated biological and technical measures is implemented, also involving use of repellents and pesticides.

As every year, game damage control (winter browsing, summer browsing and peeling) and undesirable vegetation control (mechanical and chemical control of forest weed in nurseries and plantations) played a decisive role. The activities mainly involved land application; aerial treatment represented less than 1% of the total area (fertilisation and liming of forest stands, leaf-eating insect).

In 2009, *Cephalcia abietis* was controlled on 221.5 ha of forest land owned by LČR, s.p., FD Pelhřimov. Before the actual implementation of control measures, the Forest Protection Service had conducted monitoring of the pest population. Insecticide Dimilin 48 SC was applied in the rate of 0.18 litres per ha, in adjuvant DEDAL 90 EC in the rate of 3.30 litres per ha (in 6.52 litres of water per ha, i.e. 10 litres of the mix per ha). The treatment was applied using a small helicopter with ULV technology.

Reconnaissance flights to monitor the bark beetle situation were carried out in 11 regions of the country in 2009 (except the capital of Prague, South-Moravian Region, and the Zlín Region). There were total 126 flight hours within 72 flights in 15 flight days. Approximately 300 persons were

involved in reconnaissance flights, both private owners and employees of state administrations responsible for the sector of forests and the environment.

The most severe situation was recorded in Central Bohemia (the Sázava River Basin, mainly Kácov, Zruč. n. Sázavou, areas around Sedlčany, Benešov), in the South Bohemian Region, the Pilsen Region (Šumava, around Klatovy, Horažďovice, Písek, Blatná, Strakonice, Třeboň, mountain range Novohradské Hory – Žofín) and the Moravian-Silesian Region (Nízký Jeseník, Jablunkov, Slezské Beskydy). Among other threatened sites we should mention Podkrkonoší (around Jilemnice, Vrchlabí), the surroundings of Česká Třebová and the preserves in Kralický Sněžník and Hrubý Jeseník.

3.5.3 Measures Supporting Recovery of Forests Damaged by Air Pollution – Liming and Fertilisation

Projects of chemical reclamation of forest soils have been implemented under Government Decree No.22/2004. The objective is to restore nutrition in forest stands where it is disturbed by high acidity and insufficient calcium and magnesium supply.

In 2009, only the wilting forest stands in the surroundings of Kolín and Chlumec nad Cidlinou were fertilised. A newly developed forest fertiliser Silvamix PMC was applied in form of pilot testing on 1 293 ha in two different rates – 300 kg.ha⁻¹ and 500 kg.ha⁻¹. Its composition is based on the analyses of soils and assimilatory organs from the site conducted in 2008-2009 (14% P₂O₅, 9% K₂O, 30% MgO, 14% CaO). Aerial application by planes and helicopters was carried out in the period from 30 June to 8 August 2009.

No forest stands were treated by liming in 2009.

Salvage cutting by reason

Year	Cutting				
	Abiotic	Air pollution	Insects	Other	Total
	million m ³	million m ³	million m ³	million m ³	million m ³
2000	2.39	0.08	0.32	0.50	3.29
2001	1.49	0.06	0.23	0.60	2.38
2002	3.38	0.03	0.29	0.51	4.21
2003	6.12	0.06	1.26	0.76	8.20
2004	2.76	0.04	1.27	1.30	5.37
2005	2.30	0.04	0.98	1.21	4.54
2006	5.97	0.03	1.14	0.89	8.03
2007	12.65	0.04	1.56	0.64	14.89
2008	7.60	0.04	2.31	0.80	10.75
2009	3.25	0.03	2.62	0.73	6.63

Source: Forest and Game Management Research Institute, Czech Statistical Office.

3.6 Forest Health

From the point of view of forest protection, the year 2009 may be considered as less favourable. Nevertheless, the overall situation was still better than in 2007 and 2008, when forests were seriously affected by abiotic factors (wind). The main damaging factors did not change. Among abiotic factors, most damage was caused by wind and snow, whereas outbreaks of woodborers represented the most severe biotic factor (the mutual ratio of abiotic and biotic factors was nearly equal, which is unusual and does not reflect the long-term trends).

The weather conditions were also quite balanced. Extreme weather effects (summer windstorms accompanied by rainstorms, wet snow in the beginning of winter) rather had a local character and had no impact on vast areas as was the case in the preceding two years. The total volume of salvage cutting was 6.6 million m³, i.e. significantly less than in 2008, when nearly 11 million m³ of timber were harvested this way. Salvage cutting represented 42.8% of total timber harvest in 2009.

The winter period 2008/2009 was relatively rich in snow cover, mainly in the second half of the season (at medium altitudes snow melted in the course of March). Spring came very fast though – the highest variation from normal throughout the year was recorded in April (+ 4.7 °C) with the precipitations below average (approx. 20-25 mm). This resulted in a globally fast and simultaneous bud break and removal of differences in the phenological effects in individual plant species (trees). The extreme April was followed by an average May. June and July, with the above-average precipitations, were accompanied by severe rainstorms bringing local floods (flash floods), which partly caused damage to forests stands. August and September showed precipitations and temperatures below average. Wet snow in the half of October caused

considerable regional damage both to coniferous and broadleaved forest stands. November brought warmer weather melting snow in nearly all the country. The snow cover was shallow until the end of the year even in the mountain areas.

As usual, wind caused most damage among abiotic factors, i.e. 2 million m³. Other abiotic factors did not have a serious impact on forests. Wind mainly damaged coniferous forest stands, particularly spruce. Pine forests suffered less damage in this respect. The wet snow in autumn also caused damage to some broadleaves as they still had leaves. Lower altitudes of Moravia and Silesia were hit by drought.

The recorded data show damage caused by biotic factors to approximately 2.1 million m³ of timber (approx. 1.8 million m³ in 2008). Spruce forest stands were traditionally most affected by woodborers, causing over 90% of all recorded damage. The situation in most of the countries of Central Europe is similar. While the volume of damage caused by leaf-eating pests is considered as negligible, the situation regarding woodborers becomes worse each year. Populations of other insects remained at the levels of the preceding years.

3.7 Certification of Sustainable Forest Management

The keynote of the newly established certification schemes in the world and in our country was to support sustainable forest management (sustainable forest management was defined by the 2nd Ministerial Conference on the Protection of Forests in Europe in Helsinki in 1993 as stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil,

now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems).

Forest certification proves itself to be one of the most effective market tools designed to support the principles of sustainable forest management today. It is a process in which an independent organization issues a certificate confirming that the given forest management complies with the determined criteria of sustainable forest management. Through the mentioned certificate, forest owners declare their commitment to manage their forests according to the preset criteria.

The existing requirements do not only involve utilisation of forests but a comprehensive set of social, environmental, and economic functions of the forest relating to the sustainable utilisation of natural resources.

The Czech Republic currently uses two types of forest certification schemes – FSC (Forest Stewardship Council) and PEFC (Programme for the Endorsement of Forest Certification schemes).

Overview of certified forests in 2009

Ownership category	PEFC Certified forest area	FSC Certified forest area
	ha	ha
State	1 540 793	48 666
Individuals	73 553	-
Legal entities	40 877	1 327
Municipalities	168 895	2 394
Total	1 824 118	52 387

Source: Forest Management Institute, FSC Czech Republic.





4. MAJOR INDICATORS OF TIMBER PRODUCTION

4.1 Changes in Forest Land Area

The area of forest land has been constantly slightly increasing. The increase in 2009 was by 0.082%, which appears to be a result of agricultural land afforestation.



Changes in forest land area (ha)

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009
Forest land area	2 638 917	2 643 058	2 644 168	2 645 737	2 647 416	2 649 147	2 651 209	2 653 033	2 655 212

Source: Czech Office for Surveying, Mapping and Cadastre, Forest Management Institute.

4.2 Forest Categories by Forest Function

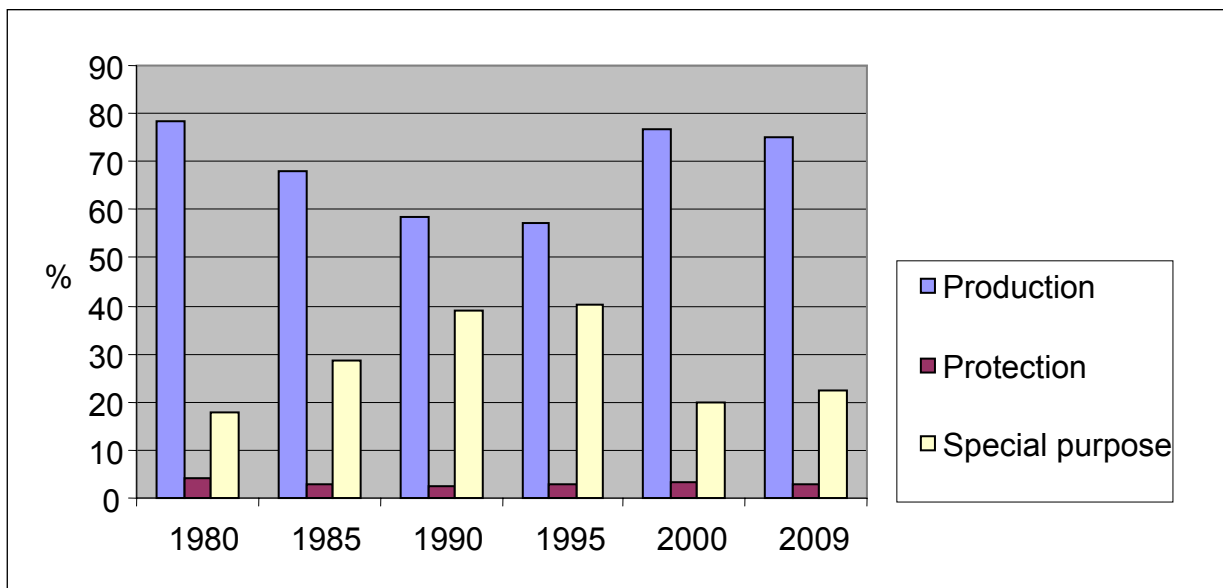
Forests are divided into individual categories according to their prevailing functions. This division has a stable character at present. There is a slight decline in the category of production forests in favour of special purpose forests.

Compared to 2008, the extent of special purpose forests increased by 0.5%.

Forest categories (%)

Year	Forest category		
	Production forests	Protection forests	Special purpose forests
	%		
1980	78.2	4.0	17.8
1985	68.2	3.1	28.7
1990	58.4	2.5	39.1
1995	57.2	2.7	40.1
2000	76.7	3.5	19.8
2009	75.0	2.7	22.3

Source: Forest Management Institute.





4.3 Species Composition of Forests

The total area of coniferous forest stands is constantly being reduced, namely by 44 193 ha compared to the year 2000. This is thanks to the foresters' persistent efforts

towards a more natural species composition of Czech forests and also thanks to the state subsidies allocated to secure an indispensable share of soil improving and stabilising tree species in forest regeneration.

Species composition in ha and % of total timber land

Species	Year						
	2000	2002	2004	2006	2007	2008	2009
Timber land in ha and %							
Norway spruce	1 397 013	1 391 970	1 381 407	1 373 628	1 369 695	1 362 205	1 352 820
	54.1	53.8	53.2	53	52.8	52.4	52.16
Fir	23 138	23 092	23 534	23 962	24 325	24 658	25 274
	0.9	0.9	0.9	0.9	0.9	1	0.97
Pine	453 159	450 224	447 013	443 589	441 807	440 188	437 466
	17.6	17.4	17.3	17.1	17	17	16.86
Larch	97 170	98 397	99 707	99 887	99 992	100 326	100 853
	3.8	3.8	3.9	3.9	3.9	3.9	3.89
Other conifers	4 587	4 906	5 617	5 764	5 763	5 964	6 212
	0.2	0.2	0.2	0.2	0.2	0.2	0.24
Conifers	1 975 065	1 968 588	1 957 278	1 946 831	1 941 582	1 933 341	1 922 625
	76.5	76.1	75.5	75.1	74.8	74.4	74.12
Oak	163 761	166 603	169 150	171 720	173 047	175 495	176 397
	6.4	6.5	6.5	6.6	6.7	6.8	6.8
Beech	154 791	160 976	168 212	174 858	178 067	182 048	187 027
	6	6.2	6.5	6.7	6.9	7	7.21
Birch	74 560	74 505	74 447	73 927	73 749	73 764	72 895
	2.9	2.9	2.9	2.9	2.8	2.8	2.81
Other broadleaves	186 185	188 865	194 064	199 710	202 684	205 991	207 408
	7.1	7.2	7.5	7.7	7.8	7.9	8.01
Broadleaves	576 808	590 949	606 983	620 215	627 548	637 299	643 728
	22.3	22.8	23.4	23.9	24.2	24.5	24.83
Total excl. unstocked areas	2 551 873	2 559 538	2 564 261	2 567 045	2 569 130	2 570 640	2 566 353
	98.8	98.9	99	99	99	99	98.95

Source: Forest Management Institute.

4.4 Forest Age Structure

The age structure of our forests remains unbalanced.

The total area of overmature forest stands (over 120 years of age) has notably been increasing. Thus, we get higher volumes of large diameter timber in the forests. This may result from specific management regimes in special protected areas and protection forests, and also from the postponed regeneration of forest stands showing less attractiveness, worse accessibility, or a lower quality.

The extent of forests below 60 years of age is still below normal. There has been a slight improvement in the first age class but the general age structure has been approaching its normal too slowly.



Percentage of age classes

Year	Unstocked area	Not determined	Age class (years)						
			I 1-20	II 21 - 40	III 41 - 60	IV 61 - 80	V 81 - 100	VI 101 - 120	VII 121 +
% of timber land									
1920	1	-	23	24	22	17	10	3	0
1930	2	-	21	21	21	19	11	5	0
1950	2	-	18	21	21	19	12	7	0
1960	1	-	17	21	20	19	13	6	3
1970	1	-	17	20	19	20	13	7	3
1980	1	-	17	15	20	20	15	8	4
1990	1,5	-	16.1	14.7	19.4	18.9	16.8	8.2	4.4
2000	1,2	0	16.7	15.5	14.7	18.8	17.3	10.2	5.5
2009	1,1	0	17.1	14.8	14.2	18.2	15.9	11.9	7
Normality	-	-	18.2	18.1	17.7	17.3	15.5	9.3	3.9

Source: Forest Management Institute.

4.5 Silvicultural and Management Systems

High forests represent an absolute majority of the total forest land (99.65%). The area of coppice with standards remains at the level of the preceding years (0.009%). The area of selection forests grew up to 2.43% of the total forest land in the Czech Republic.

4.6 Growing Stock and Increments

The total growing stock in Czech forests has more than doubled since 1930. The factors contributing to the fact are increasing increment and more precise determination using new methods and instruments implemented in the 60's and 70's of the 20th century.

Silvicultural systems

Year	Silvicultural system						
	High forest		Coppice-with-standards		Coppice forest**		Total
	1 000 ha*	%	1 000 ha*	%	1 000 ha*	%	1 000 ha*
1980	2 542	98.8	-	-	30	1.2	2 572
1990	2 576	99.7	-	-	7	0.3	2 583
2000	2 579	99.9	1	0	3	0.1	2 583
2009	2 585	99.65	2	0.09	7	0.26	2 594

Note: *Area of timber land (excluding roads, logging tracks, etc.).

** Since 1978, coppice forests and coppice-with-standards with a sufficient number of trees of good quality have been included in the high forest category.

Source: Forest Management Institute.

Growing stock volume (million m³)

Growing stock volume								
Year	1930	1950	1960	1970	1980	1990	2000	2009
million m ³	307	322	348	445	536	564	630.5	678

Note: Volume in m³ u.b., min. top diameter of 7 cm.

Source: Forest Management Institute.

Final mean annual increment

Final mean annual increment	Year												
	1880	1890	1900	1910	1920	1930	1950	1960	1970	1980	1990	2000	2009
Total	million m ³ u.b. annually												
	6.9	6.4	7.2	7.3	7.0	7.4	7.5	6.6	8.2	9.5	9.5	11.4	12.1
	m ³ u.b. annually												
Per ha of timber land	3.0	2.8	3.1	3.0	3.0	3.1	3.0	2.6	3.1	3.6	3.6	4.4	4.7

Source: Forest Management Institute.

Total mean and total current annual increment

Increment	Year					
	1950*	1970	1980	1990	2000	2009
	million m ³ u.b. annually					
Total mean	9.0	13.5	16.0	16.3	16.8	17.2
Total current	9.2	14.8	17.1	17.0	19.8	21.6
	m ³ u.b. per ha of timber land annually					
Total mean	3.7	5.3	6.2	6.3	6.5	6.6
Total current	3.8	5.8	6.7	6.6	7.7	8.3

Source: Forest Management Institute.

The increase in the total growing stock in Czech forests also continued after the year 2000 thanks to higher stand stocking, an increase in the percentage of older stands and an increase in the current increment in Europe. However, not all the stock is the same accessible for felling. The volume of felled timber in protection and special purpose forests is limited by fulfilment of protective functions or by management objectives. No felling operations are allowed in reserves and first zones of national parks.

The average growing stock per ha of forest land is 264 m³ (growing stock on timber land including clear-cuts).

Increments have been growing in all Europe since the 80's of the 20th century. However, as some studies imply, the rate of such an increase has already started to slow down. The causes of the growing increments have not been defined clearly enough until today.

From the point of view of balanced and sustainable felling possibilities, the total mean increment plays a decisive role as it determines the production potentials of forests.

When comparing increments to total felling, we have to take into account that the volume of logging residues left in the forest is not included in the data on total felling. In the past two years, the total timber harvest already exceeded the total mean increment.





5. ECONOMY IN THE FOREST SECTOR

5.1 Economic Situation of Forest Owners

The economic situation of private forest owners and the state in the sector of forest management and other minor activities experienced a certain improvement against the economic slump of 2008. Municipalities and towns suffered another decline in their profits.

The tense situation was mainly caused by a further decline in practically all average prices of the decisive timber assortments resulting from the ongoing sales crisis.

Only municipal forests showed a year-on-year drop in the economic result (profit before taxation), namely by CZK 132/ha, i.e. to the value of CZK 480/ha. On the other side, both state and private forests improved their economic result by CZK 41 and CZK 318, reaching the real values of CZK 561/ha and CZK 1 395/ha of forest land respectively. The state enterprise Lesy České republiky played the crucial role in the economy of state forests generating a profit before taxation of CZK 784 million, which is a year-on-year rise by CZK 77 million.

Financial contributions for forest management provided from the state budget and from regional budgets, reimbursement of some mandatory costs from the state budget (under the Forest Act) and financial means allocated from the EU funds represented a significant financial support for forest owners (tenants). Without these financial contributions, the actual profit from 1 ha of forest land would have represented CZK 772 in private forests and CZK 481 in state forests. Municipal forests would have even noted a negative result, i.e. a loss of CZK 228/ha. Rent represents a substantial cost item for tenants of municipal and town forests. The statistical survey in the sector shows that 52.6% of their forest area is leased and the average annual rent amounts to CZK 1 603/ha of forest land, which has a significant impact on the final profit of tenants. Private forests are leased in 28.8% for the average annual rent of CZK 1 512/ha of forest land. Rent of state forests is prohibited by law.



The total average financial support per 1 ha of forest land thus reached CZK 80 in state forests, CZK 708 in municipal and town forests, and CZK 623 in private forests. This represents an overall increase by CZK 64 in private forests, but a drop by CZK 28 in state forests and by CZK 56 in forests owned by municipalities and towns.

The higher average costs reflected in silvicultural activities, i.e. in all decisive operations (regeneration, tending of young plantations, thinning and forest protection). The total average rise for all forests was by CZK 122 per ha of forest land. Thanks to the operational efficiency and better utilisation of natural processes (particularly in natural regeneration), the actual operations are reduced to the minimum.

The costs of decisive logging operations also noted a year-on-year increase in all forests under review, namely by CZK 9/m³ in logging, by CZK 23/m³ in skidding, and by CZK 21/m³ in log transport. State forests showed the highest average costs in the mentioned operations (CZK 316/m³ in logging, CZK 265/m³ in skidding, and CZK 181/m³ in log transport). The average year-on-year increase in the costs of silvicultural operations per 1 ha was by CZK 122. State and municipal forests contributed most to the mentioned increase (by CZK 173 and CZK 258 per ha respectively), whereas private forests reduced their costs by CZK 96 per ha of forest land. The highest amounts of financial means spent on all silvicultural operations per 1 ha of managed forest land are thus recorded by municipal and town forests (CZK 2 082), then state forests (CZK 1 979), and private forests (CZK 1 443). Natural and weather conditions have a significant influence on the costs of forestry operations since they limit the use of machinery and technologies in the forest. There was an unfavourable development in the costs of repair and maintenance of forest roads, which noted a year-on-year drop. Entities managing state forests invested the most financial means in the repair and maintenance of forest roads (CZK 623 per 1 ha of forest land). Municipal forests spent the smallest amount (CZK 329 per ha).

A year-on-year fall in average conversion of raw timber and the volume of sold raw timber had a negative impact on revenues. Due to lower volumes of salvage cutting and a drop in raw timber demand and prices, the total timber harvest and supplies in the Czech Republic dropped by 685 thousand m³ to the value of 15 502 thousand m³. The balance of creation and utilisation of reserves for silviculture and other forestry operations also played its part in the year-on-year decline in the generation of profit. While state forest organizations showed a balance of CZK 56 million (i.e. prevailing creation of reserves with a negative impact on profit), municipal and private forests reached a negative balance (CZK 8 million and CZK 9 million respectively) with a positive impact on profit. This means that the use of reserves exceeded their creation determined to cover the increasing costs of particularly silvicultural activities following Windstorm Kyrill in 2007. The overall economic result was also influenced by other non-forestry operations (including sales of LČR non-essential immovables), other reserves, adjustments, and rent,

which caused an absolute increase in the profit of the entities under review (state forests by CZK 464 million) or a decrease (municipal forests by CZK 189 million, private forests by CZK 124 million).

Average prime costs of selected operations (CZK/unit)

Year		2007	2008	2009
Operation	Unit			
Forest regeneration	ha	70 525	71 850	72 986
Tending of young plantations	ha	8 439	8 654	9 331
Juvenile thinning	ha	7 398	7 536	8 353
Forest protection	ha	170	149	154
Total silviculture	ha of forest	1 681	1 745	1 867
Felling	m ³	211	258	267
Skidding	m ³	236	225	248
Hauling	m ³	189	154	175
Road repairs and maintenance	ha of forest	629	654	530

Source: Ministry of Agriculture.

Profit of forest owners (including subsidies in forests management) (CZK/ha)

Profit before taxation	2008	2008	2009
State forests	646	520	561
Municipal forests	1 114	612	480
Private forests	1 746	1 077	1 395
Average	982	667	748

Source: Ministry of Agriculture.

5.2 Economic Situation of Forestry Contractors

Despite the existing crisis, forestry contractors still have tendencies to associate into larger entities. They have already invested considerable financial means into development, their own efficient forest machinery, including harvester technologies, and operate both in the Czech Republic and abroad.

On the other hand, there are a number of entrepreneurial entities of local significance and self-employed individuals who provide services to small forest owners using traditional technologies.

With their insufficient capital, self-employed individuals and smaller companies will not access larger contracts and, as subcontractors, are forced to provide services for stronger companies under worse conditions.

The statistical report of the Ministry of Agriculture 2 – 01 “Annual Report on Costs and Revenues in Forestry 2009” shows that entrepreneurial entities involved in forestry recorded a lower loss in the course of 2009.

The following factors had the main influence on the above-mentioned loss:

- Further drop in prices of raw timber for customers
- Stagnant prices of work
- Increased costs to secure individual forestry operations

The loss was mainly the issue of entrepreneurial entities which had not secured in their tender contracts sufficient revenues from work and prices of purchased timber. According to the data provided by the Czech Statistical Office – Prices Forest 1-04 related to national timber processing industry, average sales prices of raw timber assortments dropped by 3.5 – 15.2% (3.5% assortment III.A/B class – spruce and 15.2% assortment III. A/B class – larch). Only prices of coniferous and broadleaved fuelwood rose.

The statistical survey involved economies of 26 entities incorporated in the Commercial Register with prevailing forestry activities (hereinafter referred to as ‘entrepreneurial entities’). These entrepreneurial entities provided forestry services on total about 103 thousand ha. Out of 26 entrepreneurial entities, 18 showed a profit (of total CZK 30.9 million), whereas 8 entities showed a loss (of total CZK 45.3 million). All entrepreneurial entities thus noted a total loss of CZK 14.3 million (total costs = CZK 1 201.0 million, total revenues = 1 186.7 million). This represents a loss of CZK 139/ha of managed forest land. The loss from the previous year was thus reduced (from CZK 346/ha to CZK 139/ha).

The entities under review generated profit only in nursery practice (CZK 16/ha) and other non-forestry activities (CZK 68/ha). The following activities represented a loss: silvicultural operations (CZK -15/ha), logging (CZK -84/ha), game management (CZK -28/ha), minor forest production (CZK -16/ha), and other forest activities (CZK -27/ha). The data on these entrepreneurial entities thus imply that the final loss in forestry business resulted not only



in economic difficulties but also in termination of their business activities. Despite the slight profit, a large number of the entities stagnated economically. The financial support from the state, regions and the EU in form of subsidies amounted to CZK 17/ha and only reduced the total final loss. The minimum profit or loss will thus probably lead to a reduced number of entrepreneurial entities involved in forestry and only entities with the strongest capital providing most efficient and productive forestry operations will survive.

A permanent efflux of skilled self-employed people, particularly in more sensitive regions with higher unemployment rate, is also one of the negative effects in the forest sector.

Financial situation of contractors in forestry (CZK/ha of forest)

Operation /Year	2007	2008	2009
Silviculture	256	68	-15
Harvesting	39	-369	-84
Nursery management	329	9	16
Game management	-67	-36	-28
Minor forest products	8	-	-16
Other forestry operations	79	-27	-27
Total forestry operations	374	-328	-126
Other activities	-31	-95	68
Total economic result	393	-346	-139

Source: Ministry of Agriculture.

5.3 Social Aspects in the Forest Sector

5.3.1 Labour Market in Forestry

The number of employees (individuals) in the forest sector (forestry and related activities) working for both entrepreneurial and non-entrepreneurial entities has been constantly decreasing since 1989. In 2009, there was a year-on-year reduction by 10.7%. The private sector experienced a pronounced reduction by 15.3%. The number of staff in the municipal sector and the state sector also decreased by 5.7% and 4.8% respectively.

A slight year-on-year decline in the total volume of forestry operations mainly resulted from reduced logging operations (logging follow-up operations). The reduced number of staff was compensated by higher labour productivity (use of harvesters, tree planting machines, etc.).

Number of employees in forestry

Year	2006	2007	2008	2009	
Total forest sector	20 342	19 398	17 959	16 041	
Of which	State	5 698	5 783	5 850	5 574
	Private	12 280	11 320	9 924	8 406
	Municipal	2 364	2 295	2 185	2 061

Source: Czech Statistical Office.



5.3.2 Average Income in Forestry

Compared to the preceding year, the average monthly income of individuals working in the forest-based sector increased by 5.7%. The rise of average income in forestry thus exceptionally exceeded the pay rise in industry (2.2%) and in the national economy (3.5%). However, the average income of individuals involved in the forest-based sector, both in entrepreneurial and non-entrepreneurial entities, is still behind by CZK 2 514 as opposed to industry and by CZK 2 868 compared to the average income in the national economy.

The public sector shows the highest average income in forestry, which is CZK 5 830 higher than the average income in the private sector.



Average monthly income (CZK)

Year		2006	2007	2008	2009	2009/2008
		%				
Forestry		16 196	18 020	18 779	19 856	105,7
	State forests	19 314	21 407	22 361	23 462	104,9
Of which	Private forests	15 250	16 774	17 164	17 632	102,7
	Municipal forests	15 983	17 010	18 093	19 179	106
Industry		18 638	20 285	21 894	22 370	102,2
National economy		19 003	20 333	21 957	22 724	103,5

Source: Czech Statistical Office, Ministry of Agriculture.

5.4 State Budget Funds for the Forest Sector

5.4.1 Government Financial Obligations Subject to the Forest Act

The national forest policy aims at promoting the responsibilities of forest owners for their own property and, at the same time, at enforcing the national interests in forest management related to the open landscape. This is mainly possible thanks to the legislation adopted after 1989, namely the principles of the national forest policy and the Forest Act. The Forest Act laid down conditions for a financial support of purposeful planting of soil improving and stabilising tree species (sec. 24 of the Forest Act), work of licensed forest managers (sec. 37 of the Forest Act), elaboration of forest management guidelines (sec. 26 of the Forest Act), flood protection measures on small watercourses – torrents and adjacent surroundings (sec. 35 of the Forest Act), and in other cases where no actual claims have been made. These are mandatory costs covered from the state budget.

The central body of the forest state administration is liable to pay the claimed state support and individual regional authorities provide the actual transfer of the financial means to individuals and legal persons in given periods.

The total amount allocated for the obligations under the Forest Act reached CZK 239.2 million in 2009. Out of this amount, CZK 12.9 million were used for a part

payment of increased costs necessary for planting the minimum number of soil improving and stabilising tree species, thereby supporting regeneration of approximately 2 500 ha of this type of forest stands. This represents enhancement of about 13 thousand ha of mixed forests, where the share of soil improving and stabilising tree species varies from 5% to 30%.

The state covers the costs of services provided by licensed forest managers for forest owners owning up to 50 ha of the total forest land. This reimbursement was made for total 406 thousand ha of forest land and the total costs amounted to CZK 160.1 million.

The state also pays the costs of forest management guidelines to forest owners who own a total forest area up to 50 ha and do not have a forest management plan elaborated for their property. The total area of such property amounted to 31 thousand ha with the total costs reaching CZK 23.4 million.

The state allocated financial means for soil improvement and torrent control measures where the forest state administration body had decided that it was in the public interest. These are long term measures focused on the optimisation of the water cycle in forested watersheds and on flood control in the landscape, above all, in spring areas. The amount of CZK 42.8 million was paid to support measures related to soil improvement and torrent control in the public interest. Within these measures, 16 km of torrents were trained and storage reservoirs of total capacity of 47 thousand m³ were repaired or constructed.

Forest land reclamation through regulation of water regime was not covered from the state budget. The technical units apply only to actions completed in 2009 with the funds also allocated in the preceding years.

Government financial obligations subject to the Forest Act (CZK million)

Activities	2007	2008	2009
	Allocated		
Soil-improving and stabilising species	9.6	9.7	12.9
Licensed forest managers	146.6	152.4	160.1
Forest management guidelines	24.3	20.0	23.4
Soil reclamation and torrent control	67.6	71.2	42.8
Total	248.1	253.3	239.2

Source: Ministry of Agriculture.

5.4.2 State Services Supporting Forest Management

The state provides services free of charge to help forest owners improve the standards of forest management and ensure forest protection against damaging agents. Within its consulting services, the state provides forest owners with up-to-date information concerning preventive protection of their forests and possibilities of protective measures against damaging agents.

In 2009, forest stands were fertilised by aerial application in some parts of the Czech Republic – i.e. sites Bílé Vchynice (234 ha), Býchory I (522 ha), Býchory II (268 ha), and Komárov (269 ha). Based on a public tender under the Act on Public Contracts, aerial fertilisation was carried out by Letecká lesní, a.s. on total 1 293 ha in the amount of CZK 19.3 million. The slow release powder fertiliser contained P₂O₅ 14%, K₂O 9%, MgO 30% and CaO 14%, and was applied in the rate of 300 kg or 500 kg per ha (according to the requirements set by the 'Regulations', which were integral part of the contract). In contrast to the preceding years, no liming with dolomitic limestone was carried out.

In the past, comprehensive aerial fire services were indispensable for forest owners on the total area of 2.4 million ha of forest land in the Czech Republic – i.e. 91% of the total forest area (excluding forests under responsibility of the Ministry of Defence and the Ministry of the Environment) with the objective to protect forests against fire. Under the Contract on Cooperation within Aerial Fire Services concluded between the Ministry of Interior and the Ministry of Agriculture, the activity was only partly secured in 2009 (in parts of Central Bohemia and the South Moravian Region) by the Aviation Service of the Police of the Czech Republic. Due to repeated appeals against tenders, the contract could not be concluded and most of the forests remained unprotected against fire.

The total costs of aerial fire services amounted to mere CZK 1.3 million. There were total 13 patrol flights of 30 hours and 11 minutes during which 7 fires were determined. Helicopters of the Aviation Service of the Police of the Czech Republic fought 13 fires dropping 16 water bombs while flying 24 hours and 12 minutes.

Large-scale forest protection treatment was done by aerial spraying against the horse chestnut leaf miner (*Cameraria ohridella*) on total 60 ha on site Sedlice u Blatné and in game preserves Březka and Vlková (Central Bohemia). Other application was against *Cephalcia abietis* on 221 ha on site Benešov near Pelhřimov. Reconnaissance flights aimed at determining the forest conditions (in particular the situation regarding bark beetle) in the Czech Republic had an extent of 126 flying hours.

The total costs of the large-scale treatment and reconnaissance flights amounted to CZK 1.7 million.

VÚLHM, v.v.i. (also referred to as the 'Forestry and Game Management Research Institute' or 'FGMRI') continued providing expert and consulting services to forest owners upon request and free of charge in the areas of forest protection, forest seed management, nursery management, artificial regeneration and reforestation, including assessment of the quality of planting material, planting of fast growing species, regeneration and tending of forest stands, game management, protection of the forest against game damage, and in the sector of biotechnologies and preservation of gene pool of forest tree species. It also provided these services related to the support of economic viability of forest businesses and issued free of charge its opinions of the Forest Protection Service required for subsidies applications (recovery of the forest potential). The Ministry of Agriculture paid total CZK 31.5 million for the provision of these services.

Workshops organized mainly for forest owners and their licensed forest managers within the consulting and training activities contributed to a higher standard of forest management. As in the preceding years, these workshops were organized by professional forestry organizations and associations (Association of Municipal and Private Forest Owners in the Czech Republic, Czech Forestry Society, Union of Forest Owners and Forestry Entrepreneurs in the Czech Republic, The Czech Chamber of Licensed Forest Managers, Foresta SG, a.s., Secondary Forestry School in Hranice, Community for Spiritual Growth, Wood for Life Foundation and Vodní zdroje Ekomonitor, s.r.o.). The Ministry of Agriculture paid a total of CZK 1.4 million for the services provided by these professional associations and organizations.

Payment of other services totalled CZK 5.9 million. These involved taking soil samples and assimilatory organs to determine the conditions of forest soils and forest stand nutrition in specified nature forest areas (conducted by FMI), subsequent analysis and assessment of previous samples, assessment of samples from 'Permanent Sample Plots' (conducted by Central Institute for Supervising and Testing in Agriculture), evaluation of the effectiveness of

liming and fertilisation of forests (mainly in polluted areas), including preparations of projects related to chemical soil improvement and verification of the quality of fertilisation (conducted by Forestry and Game Management Research Institute).

State services supporting forest management (CZK million)

Year	2006	2007	2008	2009
Type of service				
Aerial liming and fertilisation	45	22	44	19
Airborne fire control service	15	10	25	1
Large-scale measures in forest protection	2	1	1	2
Consultancy	23	23	21	33
Other services	6	3	6	6
Total	91	59	97	61

Source: Ministry of Agriculture.

5.4.3 Subsidies from the State Budget

Support of forest management in form of subsidies from the state budget was provided under Annex No. 9 of Act No. 487/2009 Coll., on the state budget of the Czech Republic for 2010 (hereinafter referred to as the 'Rules'). Under the general conditions set up by the Rules, forest owners could apply for subsidies to forest management under the following scheme:

In forests under the responsibility of the Ministry of the Environment and the Ministry of Defence, applications could be filed for subsidies for regeneration of air-polluted forests (under letter A), subsidies for regeneration, establishment and tending of forest stands (under letter B), subsidies for associations of owners of small forests (under letter C –allocated under Commission Regulation (EC) No. 1998/2006 on the application of Articles 87 and 88 of the Treaty to *de minimis* aid), subsidies for ecological and environmentally friendly technologies (under letter D), subsidies for selected activities in game management (under letter G), and subsidies for the elaboration of forest management plans in digital form (under letter H).

The Ministry of Agriculture provided subsidies under letters G, H, and I. Subsidies under letter K (breeding and training of national breeds of hunting dogs and birds of prey), which applies to breeders regardless their relation to forest land, was also provided by the Ministry of Agriculture all over the country.

Under letters G, H, K and I, the Ministry of Agriculture paid from its budget total CZK 86 951 thousand.

The Ministry of Defence granted subsidies amounting to CZK 22 285 thousand, i.e. CZK 18 727 thousand for

regeneration, establishment and tending of forest stands (subsidies under letter B) and CZK 3 558 thousand for ecological and environmentally friendly technologies (subsidies under letter D).

The Ministry of the Environment paid total CZK 3 900 thousand on subsidies. CZK 3 475 thousand was allocated for regeneration, establishment and tending of forest stands, and CZK 424.7 thousand for ecological and environmentally friendly technologies.

5.4.4 Aids from Supporting and Guarantee Agricultural and Forestry Fund, plc.,

Podpůrný a garanční rolnický a lesnický fond, a.s. (also referred to as the 'Supporting and Guarantee Agricultural and Forestry Fund' or the 'Fund') represents one of the possible aids for forest management entities as it provides support for granted loans.

The Fund is owned 100% by the state. In addition to other activities, it provides subsidies to lower the loan interests, covers insurance, and secures bank loans.

There have been total 643 applications submitted in the sector of forest management since the establishment of the Fund, 566 of which have been approved. Total supported loans amounted to CZK 2 489 million; provided guarantees amounted to CZK 598 million and granted subsidies amounted to CZK 470 million. Total CZK 458 million was paid on subsidies as at 31 December 2007.

The total amount paid for guarantees reached CZK 80 million as at 31 December 2009 and over CZK 10 million was paid based on the payment schedule. No guarantee was paid in 2009 and the amount of CZK 665 thousand was repaid from previously paid guarantees based on the payment schedule.

A new programme called Financial Support for Insurance of Forest Nursery Production was launched in 2009. It is designed to cover 30% of the costs related to the mentioned insurance. Approved applications for subsidies involved insurance of total CZK 193 thousand. The actual paid support amounted to CZK 58 thousand.

5.5 Aids Co-financed by the EC under the Rural Development Programme of the Czech Republic for 2007 – 2013

The year 2009 was the third year allowing applications for financial support from the European Agricultural Fund for Rural Development 2007-2013 under the Rural Development Programme of the Czech Republic for 2007-2013 (hereinafter referred to as the 'RDP').

The RDP is based on the National Strategic Plan of Rural Development drawn up in accordance with Council Regulation (EC) No. 1698/2005 and its associated secondary legislation. The document mainly focuses

on forestry in Axis I - Improving the competitiveness of agriculture and forestry, which involves measure I.1.2. Investment in forests, and Axis II - Improving the environment and landscape. Axis II continued in 2009 to be open for applications for measure II.2.1 – Afforestation of agricultural land; entities could file their applications for the second time under measure II.2.2 – Payments within Natura 2000 forest areas. Measure II.2.3. – Forest-environment payments was newly opened for applications and, for the sixth time, applications could be submitted under measure II.2.4.2 – Restoring forest potential after disasters and promoting social functions of forests.

Axis I of the RDP contains **measure I.1.2. Investment in forests**, which is further divided into submeasures **I.1.2.1. Forestry machinery, I.1.2.2. Technical utilities of business establishments**, and submeasure **I.1.2.3 Forestry infrastructure**.

The strategic objective of the mentioned measure is to enhance the competitiveness of forestry, to support the development of dynamic businesses in the forest sector, to reach higher efficiency of forest enterprises, to restructure the forest sector, and to improve the protection of the environment related to forests. The supported actions should be a solution to problems related to an insufficient infrastructure in forestry.

In 2009, applications were accepted for the third year for subsidies under measure I.1.2. The eighth round of applications (6-26 October 2009) recorded 695 projects with the subsidies totalling CZK 917 103 272. Approved were 336 projects amounting to CZK 333 544 418. Payments will be made in the course of the following years based on applications for reimbursement.

For the second year in 2009, applications could be submitted under **measure II.2.2 – Payments within Natura 2000 in forests**, which consists of a single **submeasure II.2.2.1 Conservation of a forest management group from previous production cycle**. This submeasure is aimed at conserving, for a period of 20 years, the type of forest management groups, or better the ideal species composition (of particularly broadleaf and fir stands, and coppice), in areas of Natura 2000 (Special Areas of Conservation and Special Protection Areas under Act. No. 114/1992 Coll.) owned by private entities. The implementing instrument is Government Decree No. 147/2008 Coll. on determining the conditions for granting subsidies aimed at conservation of the management group of a forest stand under Natura 200 measures for forests, as amended.

In 2009, 5 applications were submitted to register 760.44 ha. Eleven applications for subsidies comprised 1 029.93 ha and totalled CZK 1 657 672.30 to be paid in 2010.

Measure II.2.3 – Forest-environment payments was newly opened for applications. It consists of a single **submeasure II.2.3.1. Improving the species composition of forests**, which aims at appropriate species composition and spatial arrangement of forest stands. This is understood as increasing the share of soil

improving and stabilising forest tree species, which are more resistant to damaging factors and have a positive impact on soil quality.

Measure II.2.4 – Restoring forestry potential after disasters and promoting social functions of forests encompasses submeasure **II.2.4.1. Restoring forestry potential after disasters and introducing prevention actions** and submeasure **II.2.4.2. Non-productive investments in forests**. The year 2009 was the second year of this measure under the RDP. Total 188 projects were registered in the amount of CZK 129 159 227. Payments will be made in the course of the following years depending on applications for reimbursement.

5.6 Aid for Afforestation of Agricultural Land

Support of afforestation enjoys a long tradition in the Czech Republic. Until 2003, subsidies for afforestation were provided only from the national financial sources. Since 2004, afforestation has been mainly supported from the European financial sources, first from the Horizontal Rural Development Plan of the Czech Republic for 2004-2006 (HRDP) and since 2007 from the Rural Development Programme of the Czech Republic for 2007-2013.

The Rural Development Programme of the Czech Republic for 2007-2013 involves **measure II.2.1 – Afforestation of agricultural land**, which consists of a single **submeasure II.2.1.1 First afforestation of agricultural land**. Government Decree No. 239/2007 Coll., on laying down conditions for granting subsidies for agricultural land afforestation, as amended, is the implementing national legal regulation.

This support gives space to diversification in production, which strengthens the economic and social dimensions of sustainability of agriculture and rural areas and reduces the share of arable land with no risk of more agricultural land under no management. Under the mentioned submeasure, the owners or tenants of agricultural land determined for afforestation may apply for support. Subsidies may be granted in order to establish a forest stand and, under further conditions, also for tending operations and as compensations for ceased agricultural production on the given afforested land. Total 767 applications amounting to CZK 46.817 million were filed under this submeasure in 2009 (RDP). The amount paid from the preceding years was CZK 69.2 million and covered 698 applications (RDP and HRDP).





6. TIMBER MARKET

6.1 Domestic Timber Market

The total timber supply noted a year-on-year drop by 685 thousand m³ amounting to 15 502 thousand m³, softwood supply representing 14 047 m³ and hardwood 1 455 thousand m³.

Softwood supplies dropped against the preceding year by 830 thousand m³ whereas hardwood supplies increased by 145 thousand m³.

The sales crisis in the entire forest-based sector, which successively moved from the USA to other countries in the world, had a considerable impact on the total volume of logging and subsequent supplies of timber. Europe suffered to a great extent from the crisis (resulting, in particular, in a significant fall in export of wood and paper commodities – sawn timber, agglomerated boards, pulpwood, paper, furniture, etc.). Slackening sales of these commodities and their growing stocks logically brought along a considerably lower interest in timber. An expressive fall in demand for decisive assortments of timber (mainly softwood roundwood and pulpwood) caused a further drop in their prices throughout the entire year. Contrary to the preceding year, forests were not seriously damaged by windstorms (except regions with spruce forests affected by bark beetle outbreaks) and the share of salvage cutting dropped down to about 40%. Thus, Forest owners were not pushed to log excessive amounts of timber, which would have resulted in a further increase in the supply on the Czech market.

Timber supply (1 000 m³)

Delivered assortments (excl. imports)		2007	2008	2009
Roundwood*		10 504	8 928	8 852
Of which	Softwood	10 004	8 503	8 332
	Hardwood	500	425	520
Pulpwood**		6 134	5 379	4 917
Of which	Softwood	5 784	4 984	4 556
	Hardwood	350	395	361
Fuelwood		1 870	1 880	1 733
Of which	Softwood	1 490	1 390	1 159
	Hardwood	380	490	574
Total timber supply		18 508	16 187	15 502
Of which	Softwood	17 278	14 877	14 047
	Hardwood	1 230	1 310	1 455

Note: *Including pole and mine timber.

** Including groundwood.

Source: Czech Statistical Office, Ministry of Agriculture.

6.2 Timber Exports and Imports

With the accession of the Czech Republic to the EU, the so called 'automatic licences' that served to register exported amounts of timber were cancelled. The trade with timber became liberal. Neither export nor import duty is imposed. The national license system was cancelled; export of timber within the EU is not licensed. Free movement of goods within the EU countries is simplified and recorded in Intrastat; the trade with countries outside the EU is recorded in Extrastat. The data only do not reflect the values from small companies that do not pay VAT.

Exporters and importers of timber, forest plants and seeds, etc., are obliged to comply with Decree No. 662/2004 Coll., on the protection against the introduction and dissemination of harmful organisms of plants and plant products, as amended, which implements the corresponding EC directives.

Timber export noted a year-on-year increase by 1 403 thousand m³ and totalled 5 566 thousand m³. Softwood roundwood and softwood pulpwood increased (by 689 thousand m³ and by 1 198 thousand m³ respectively), while a certain decrease was recorded in hardwood roundwood and pulpwood (by 20 thousand m³), chips, particles, sawdust and wood waste (total by 511 thousand m³).

Timber import noted a year-on-year increase by 740 thousand m³ and totalled 1 862 thousand m³. Softwood roundwood and pulpwood represented the main increase (by 737 thousand m³), followed by hardwood roundwood (by 81 thousand m³).

The active balance of foreign timber trade noted a slight year-on-year decrease amounting to CZK 3.796 billion. Total 99.7% of export was directed to the EU-25; the majority to Austria (61.4%), Germany (31.2%), Slovakia (3.0%). Timber was also imported mainly from the EU-25 – 91.8% of the total import value. The majority was imported from Slovakia (52.5%), Germany (14.7%) and Austria (3.2%).

In comparison to the year 2008, the total timber export increased (by 1 403 thousand m³) with its value rising by CZK 921 million. The timber import noted an increase (by 740 thousand m³) with its value going up by CZK 986 million. It is obvious that the sales crisis in our country made the forest owners and retailers to export, for example, 30.2% of Czech softwood roundwood and 35.1% of softwood pulpwood to other countries. On the other hand, sawmills and pulp mills in some regions of the Czech Republic had insufficient supplies of softwood roundwood and pulpwood and were forced to import mainly from Slovakia, Germany, and Poland. Austria, where the Czech Republic traditionally exports most roundwood for further processing, neither managed to avoid the sales crisis and a drop in prices. Despite this fact, export particularly from border areas of the Czech Republic was still an acceptable solution for Czech exporters.

Timber exports and imports in the Czech Republic

	Exports	Imports	Balance	Exports	Imports	Balance	Exports	Imports
	CZK million			1 000 m ³			Average price CZK/m ³	
Total	6 202	2 406	3 796	5 566	1 862	3 704	1 114	1 292
Of which								
EU - 25	6 186	2 208	3 978	5 564	1 778	3 786	1 112	1 242
Germany	1 933	353	1 580	1 449	272	1 177	1 334	1 298
Austria	3 810	77	3 733	3 779	87	3 692	1 008	885
Slovakia	187	1 264	-1 077	171	1 065	-894	1 094	1 187

Source: Czech Statistical Office.

Annual volumes of timber exports and imports (CZK million)

	2007			2008			2009		
Trade balance	Exports	Imports	Balance	Exports	Imports	Balance	Exports	Imports	Balance
Total	6 387	1 752	4 635	5 281	1 420	3 861	6 202	2 406	3 796
Of which the EU	6 382	1 507	4 875	5 256	1 270	3 986	6 186	2 208	3 978

Source: Czech Statistical Office.

Timber exports and imports in the Czech Republic (1 000 m³)

	Exports	Imports
Softwood roundwood and pulp	4 114	1 416
Of which		
Spruce	3 356	1 094
Pine	420	308
Other	338	14
Hardwood roundwood and pulp	147	142
Of which		
Oak	18	9
Beech	85	84
Poplar	4	9
Birch	8	9
Other	32	31
Industrial roundwood	4 261	1 558
Charcoal	3	15
Fuelwood	167	29
Chips, particles	359	116
Sawdust	611	70
Wood waste	165	74
Total	5 566	1 862

Source: Czech Statistical Office, Ministry of Agriculture.



7. RESEARCH, PROMOTION AND PUBLIC RELATIONS

7.1 Forest Research

The Forestry and Game Management Institute – Strnady (FGMRI) is one of the organizations involved in the basic and applied forest research. Besides the FGMRI, there are other public universities and institutions dealing with forest research in the Czech Republic, such as the faculties of forestry and wood sciences in Prague and Brno, branches of the Academy of Sciences of the Czech Republic in České Budějovice and Brno, and also private research organizations.

Forestry and Game Management Research Institute

In 2009, the Forestry and Game Management Research Institute carried out total 70 research and expert activities for various clients. Within the main activity of the Institute, i.e. research, a new research programme of the Ministry of Agriculture was launched, namely research programme 0002070203 – ‘Stabilisation of Forest Functions in Biotopes Disturbed by Anthropogenic Activity under Changing Ecological Conditions’. Thirteen projects were implemented under the National Agency for Agricultural Research and the National Research Programme and seven new research projects were launched under the National Agency for Agricultural Research.

In 2009, six research projects were conducted for other clients – grant agencies (Czech Science Foundation, Ministry of the Environment, Ministry of Education, Youth and Sports) and 5 research projects for the LČR Grant Service.

Considerable attention is being paid to international research projects. Six projects were implemented in 2009 under the research programme COST, programmes ICP Forests, Euforgen, and TREEBREEDEX and within bilateral agreements (Assistance to Bosnia, etc). In 2009, membership fees were paid in international organizations EFI, IUFRO, ISTA and ICP Forests.

As to other activities closely related to the main research work of the Institute, there were 17 projects carried out based on contracts for the Ministry of Agriculture, which had a character of functional tasks or consulting services for forest owners or managers. They focused on the following areas – forest protection service, forest seed management, management of fast growing tree species, control of reproductive resources, conservation of forest tree species gene pool through biotechnologies, nursery management, forest regeneration and silviculture, damage caused to the forest by air pollution, protection of game gene pool, forest protection against game damage, efficiency control in liming, and access to professional and published information.

In 2009, the staff of the Institute took part in a number of national and international conferences. They represented the Czech Republic at negotiations resulting from resolutions of Ministerial Conferences on the Protection of Forests, such as ICP Forests, ForestBiota, Euforgen, etc. The institute participated in the preparations of a new European monitoring project related to forest health called ‘Forests in the European Union - Provision of policy relevant information (ForEU)’. Following the tradition of the preceding years, the Institute very closely cooperated with both forestry faculties and other universities in the area of pedagogy and with forestry institutions in the area of dissemination and promotion of research outcomes for the purposes of forestry practice.

Faculty of Forestry and Wood Sciences of the Czech University of Life Sciences in Prague

Research and scientific activities are integral part of work of the Faculty of Forestry and Wood Sciences of the Czech University of Life Sciences in Prague. Research projects coming from grant agencies are the main source of financing for science and research at the Faculty.

In 2009, the Faculty of Forestry and Wood Sciences conducted total 20 external grant projects assessed by the Research and Development Council of the Government of the Czech Republic (filed in the Central Register of R&D Projects) with their total financial contribution exceeding CZK 15 million. The structure of projects/grants by clients was as follows: Czech Science Foundation (4 projects), Ministry of Agriculture (13 projects, one of them focusing on international cooperation between the Czech Republic and Vietnam), Grant Agency of the Academy of Sciences of the Czech Republic (1 project), Ministry of Education, Youth and Sports (2 projects).

Total 30 projects of more than CZK 1.1 million were supported from the budget of the Internal Grant Agency of the Faculty in 2009. The Grant Agency financially supports projects of young scientists and students of doctoral and master study programmes.

The outcomes of scientific and research activities are regularly published in scientific and professional journals and at scientific conferences. In 2009, the members of the Faculty published total 21 articles in IF scientific journals, 50 articles in non-IF scientific journals, 15 books, and a great number of articles in professional journals and contributions in proceedings of scientific conferences.

Preparations for scientific practice – doctoral study programmes – represent a significant part of the Faculty activities. The Faculty of Forestry and Wood Sciences offered 6 accredited study programmes for total 183 students in 2009 in both daily and combined forms of studies. In the course of 2009, 10 students defended their theses with success and acquired a PhD.

The members of the Faculty of Forestry and Wood Science establish each day more international relationships in Europe and get involved in international teams (e.g. under the 6th framework EU programme CECILIA dealing

with climate change) and working groups (Conversion of Forests – CONFOREST, International union of forest research organisations - IUFRO). More intensive cooperation continued in 2009 with significant universities of forestry and the environment inside and outside Europe, international organisations, and other entities. These are, for instance, COST FP0603: Forest models for research and decision support in sustainable forest management, COST E51: Integrating Innovation and Development Policies for the Forest Sector, cooperation on research projects with the regional centre of the European Forest Institute INNOFORCE in Vienna, a newly established intensive cooperation with organisations in Latin America on projects of reforestation of devastated areas, forest protection, and multifunctional forest management (INAB Guatemala, EUROTEC, group Kanguroid in Colombia, etc.). The tradition of cooperation at the national level continued and involved universities, related research institutes, businesses, and state administration bodies.

Faculty of Environmental Sciences of the Czech University of Life Sciences in Prague

The main scope of research activities at the Faculty of Environmental Sciences lies in the area of landscape and environment. Research is provided by total 6 departments (Department of Applied Geoinformatics and Spatial Planning, Department of Environmental Engineering, Department of Ecology, Department of Land Use and Improvement, Department of Water Resources and Environmental Modelling, and Department of Landscape Ecology).

The Faculty of Environmental Sciences solves current problems of anthropogenically exploited landscape in the conditions of Central Europe, in particular protection and enhancement of the ecological stability of the landscape, issues of biological diversity, ecology of populations and communities, nature conservation, management of protected areas, landscape ecology, optimisation of water regime in the landscape, flood control measures, revitalization of river systems, land reclamation, soil protection, arrangement of landscape area, issues related to waste, old environmental loads, transport of pollution, and also environmental impact assessment (EIA and SEA), environmental systems of management or environmental education.

In 2009, the Faculty conducted total 30 external grant projects with their total financial contribution exceeding CZK 21.5 million. The structure of projects by grant providers is the following: Czech Science Foundation (6 projects), Ministry of the Environment (2 projects), Ministry of Agriculture (4 projects), National Agency for Agricultural Research (7 projects), Ministry of Education, Youth and Sports (4 projects), Ministry of Industry and Trade (1 project), Academy of Sciences of the Czech Republic (1 project), and the University Development Fund (5 projects).

Total 50 projects of CZK 880 thousand were supported from the budget of the Internal Grant Agency of the Faculty of Environmental Sciences in 2009. The Internal Grant Agency supports projects of students of doctoral and master study programmes at the Faculty.

The outcomes of scientific and research activities are regularly published in scientific and professional journals and at scientific conferences. In 2009, the members of the Faculty published total 48 articles in IF scientific journals and 49 articles in non-IF scientific journals, 10 books, 91 articles in proceedings at conferences, and they created 7 authorised software programmes, 5 certified methodologies, and 3 series of thematic maps.

Preparations for scientific practice – doctoral study programmes – represent a significant part of the Faculty activities. In 2009, the Faculty of Environmental Sciences was offering 4 accredited study programmes in the Czech language (Applied and Landscape Ecology, Ecology, Environmental Modelling, and Water Regime Improvement in the Landscape) for total 201 students of both daily and combined forms of studies.

The members of the Faculty of Environmental Sciences establish new international relationships and get involved in international teams and working groups. A closer cooperation continued in 2009 with significant universities with an environmental focus inside and outside Europe, international organisations, and other entities. The tradition of cooperation at the national level continued and involved universities, related research institutes, businesses, and state administration bodies.

Faculty of Forestry and Wood Technology of Mendel University in Brno

The Faculty of Forestry and Wood Technology of Mendel University of Agriculture and Forestry in Brno traditionally pays attention to studies of forest ecosystems and landscape, assessment of forest conditions and forest environment, scenarios of forest development, growth process modelling, enhancement of forest resistance with respect to potential climate change, research in new technological processes in forest management or use of advanced methods of decision-making analyses in forestry planning. The Faculty also searches new potentials of forestry and wood processing industry in the social and economic development of the Czech society, and effective approaches in landscape management. There is a new development in disciplines related to bionics, biomechanics and bioenergetics. Comprehensive counting methods are applied when dealing with physical and biological processes, technological transfer and modifications of properties of natural material. Industrial research focuses on issues relating to applied design in housing, wood constructions and their elements. Methods based on genetics and molecular biology find their use in biology disciplines. The facilities of the Training Forest Enterprise Křtiny managed 10 390 ha of land in 2009 and represented a firm background for research and studies at the Faculty.

The outcomes of the scientific research and creative activities are presented at the level of fully reviewed scientific publications, including in IF journals, monographs, publications in professional journals, at scientific and professional symposia, congresses, conferences,

workshops, and exhibitions. The priority of creative activities is to make use of patents and used samples as one of the priorities of the Research and Development Council of the Government of the Czech Republic and the European research in general.

In 2009, the Faculty published 58 monographs, 110 original scientific researches, 28 of which in IF journals, 203 contributions in proceedings, and 143 popular science articles. In addition, the Faculty provided consulting services, including as a certified expert institute.

7.2 Publicity, Publishing, Audio-Visual Programmes

Promotions and publishing activities focused on consulting services for and awareness of professional and non-professional public involved in forestry, and on promotion of forestry among the general non-professional public.

Consulting services and awareness activities in the forest sector were mainly conducted through professional forestry press, aimed publishing, promotion materials, exhibitions and video programmes published by the Forest Management Section of the Ministry of Agriculture.

Overview of activities of the Forest Management Section relating to publishing, video programmes, exhibitions and communication with the public:

Publishing

Zpráva o stavu lesa a lesního hospodářství ČR v roce 2008 (*Report on the State of Forests and Forestry in the Czech Republic 2008*)

Information on Czech Forestry

Seznam povolených přípravků na ochranu lesa (*List of permitted products in forest protection*)

Průvodce možnostmi získávání podpor z Programu rozvoje venkova 2007 - 2013 a dalších podpor pro lesní hospodářství (*Potential Financial Aids from the Rural Development Programme 2007-2013 and other Supports in the Forest Sector*)

Rybářství, včelařství, lesnictví a myslivost v ČR z pohledu tradice a současnosti (*Fish Culture, Beekeeping, Forestry and Game Management in the Czech Republic from the Traditional and Modern Point of View*)

FORMICA – Zpravodaj pro aplikovaný výzkum a ochranu lesních mravenců (ČSOP Liberec) (*information brochure for applied research and protection of wood ants – Czech Union for Nature Conservation Liberec*)

Video Programmes

The following two video programmes were made in the course of 2009 to promote Czech forests:

- Lesy Jizerských hor (*Forests of the Jizerské hory Mts.*)
- Lesy Krkonoš (*Forests of the Krkonoše Mts.*)

The Forest Management Section directly participated in the following national and international exhibitions:

NATURA VIVA 2009 Lysá nad Labem

ZEMĚ ŽIVITELKA 2009 České Budějovice

JAGT UND HUNT 2009 Dortmund – Czech Republic was a partner country

The journal **Lesnická práce** (*Forest Work*), which focuses on forest science and practice, published the following professional articles written by the staff of the Forest Management Section:

- Forestry during the Czech Presidency of the Council of the EU
- First National Meeting of Forest Pedagogues
- Forestry in the EU
- Forest Week in 2009
- Preparations for the International Workshop to Support the Implementation of the EU Forest Action Plan
- Forestry in Germany
- Support of Forestry from the State Budget, Ministry of Agriculture
- Forestry between the Enlargement of the EU and the Czech Presidency
- Negotiating Emergency Situation, Preventive Measures to Avoid Imminent Damage
- Public Use of Forest Roads
- Economic Result of Lesy ČR in 2009

The Section of Public Relations and Publicity of Forest Management carried out several projects in 2009, which were mainly oriented at awareness and promotion of forestry.

Promotion and education programmes on forests and forestry for children were also organized in form of accompanying programmes at the exhibition NATURA VIVA in Lysá nad Labem, Ohrada and National Hunting Festivities at the castle Hluboká nad Vltavou, the national exhibition ZEMĚ ŽIVITELKA, and an exhibition called Education and Craft in České Budějovice.

From primary schools, 265 children took part in an accompanying programme in Lysá nad Labem (FMI České Budějovice, LČR, VLS ČR) and 120 children took part in the programme in Hluboká nad Vltavou (FMI České Budějovice).

In the second half of the year, 362 children took part in activities organized within the exhibition ZEMĚ ŽIVITELKA (FMI České Budějovice) and 740 children enjoyed the special programme at the exhibition Education and Craft held in České Budějovice (FMI České Budějovice).

Total 1 487 children participated in the mentioned actions.



8. OTHER FOREST-BASED ACTIVITIES AND SECTORS

8.1 Game Management

In 2009, there were 5 753 managed hunting grounds in the country with their total area of 6 861 933 ha. These were namely 195 game preserves of total 45 840 ha and 287 pheasantries of total 96 570 ha. An average area of a hunting ground is 1 193 ha, of a game preserve 235 ha, and of a pheasantry 336 ha.



Spring stocks of main game species (pcs)

	2005	2006	2007	2008	2009
Red deer	28 550	27 812	28 977	29 266	29 895
Fallow deer	21 676	22 494	23 964	25 067	25 701
Mouflon	18 274	18 689	20 510	20 182	20 738
Roe deer	302 694	296 509	310 920	318 252	317 596
Wild boar	46 699	48 084	56 986	57 770	57 981

Source: Ministry of Agriculture, Ministry of the Environment, Czech Statistical Office.

Hunting of main game species (pcs)

	2005	2006	2007	2008	2009
Red deer	20 668	16 871	20 217	21 415	21 527
Fallow deer	10 308	9 972	11 395	13 394	13 309
Mouflon	7 241	6 893	8 320	9 304	9 118
Roe deer	124 287	99 074	108 992	127 213	131 875
Wild boar	100 608	59 904	121 192	138 854	121 821
Duck	347 596	247 322	328 225	315 773	286 024
Pheasant	588 513	588 555	664 251	598 176	530 444
Hare	93 377	67 544	115 065	105 745	84 111

Source: Ministry of Agriculture, Ministry of the Environment, Czech Statistical Office.

In the preceding five years, there had been a trend of constantly increasing minimum viable populations of all main species of hoofed game. This trend was halted in 2009 with the future prospects to reduce these populations to a standard. Special attention deserves the successful hunting of wild boar, although the total number of hunted animals, i.e. 121 821, was lower by 17 033 in 2009 than in the preceding record year. The positive figures are also a result of the ongoing campaign of the Ministry of Agriculture and recommendations for the state administration of forests and game management, as well as of a responsible approach of hunting ground managers, who strive to reduce the populations mainly by hunting piglets and yearlings. In 2009, the number of hunted piglets and yearlings was 115 440, i.e. 95% of total hunting.

During 2009, the Ministry of Agriculture, in cooperation with the Ministry of the Environment, the Forestry and Game Management Research Institute Jíloviště-Strnady, and the field experts on four selected sites in the country - České Budějovice, Žlutice, Hranice, Teplice, continued in its campaign focused on **'Damage caused by game and possible solutions'**.

The aim of the information campaign was to acquaint the public with the negative impacts of excessive populations of game on the natural environment and to present the solutions the existing legislation offers in this respect.

Within its standard responsibilities and based on the data submitted by the bodies of state administration in game management, the Ministry of Agriculture assessed

the exceptional measures towards the reduction of hoofed game populations. Out of total 3 458 applications submitted by users of hunting grounds under sec. 36(5) of Act No. 449/2001 Coll., on game management (hereinafter referred to as the 'Game Management Act'), 3 973 were approved and only 7 denied.

There were 2 188 applications filed for exceptional hunting under sec. 39 of the Game Management Act. Affirmative decisions were issued in 2 230 cases and 39 applications were dismissed. The higher number of issued decisions than the number of applications is given by the fact that the measures taken by the state administration bodies in game management seek to reduce the populations of game more rigorously on areas extending over more than a single hunting ground. The total number of applications and final permits for the above-mentioned hunting implies a turnover in game management related to the reduction of game populations. This is particularly in forest hunting grounds, where the interest is to reduce the damage caused by game, to improve the forest condition, and to regulate the age structure and sex ratio of game populations. No minimal or standard populations of hoofed game are laid down for hunting grounds. There is also a continuous need to radically reduce the numbers of hoofed game.

Under its subsidy policy, the Ministry of Agriculture continued supporting various game management activities and paid total CZK 12.1 million. The largest amounts were allocated to enhance the living conditions for game, i.e. establishment and maintenance of feeding grounds (38.5%), production and installation of nesting boxes for water birds (17.3%), production and installation of concrete holes as fox traps (10.5%), and for hunt tests of dogs (Cesky Fousek, Cesky Terrier, 6.0%). Other activities were allocated 0-4% of the total aid. The mentioned support put the main emphasis on enhancement of the living conditions of game and on control of predator populations.

8.2 Timber Processing Industry

Manufacture of wood and wood products, except furniture (NACE 20), involves the following five branches:

- sawmilling and planing of wood; impregnation of wood (Group 20.1)
- manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other panels and boards (Group 20.2)
- manufacture of builders carpentry and joinery (manufacture of windows, doors, frames, wood constructions and its parts, glulam and trusses – Group 20.3)
- manufacture of wooden containers (Group 20.4)
- manufacture of other wood products; manufacture of articles of cork, straw and plaiting materials, except furniture (Group 20.5).

The wood processing industry processes almost exclusively domestic renewable material – raw timber, mostly softwood and hardwood roundwood. The production was, however, considerably influenced mainly by a crisis on the sawn timber market (particularly as a result of a mortgage crisis in the USA) and by the Czech koruna strengthening against the US dollar and the euro. Sawmills and other timber processing plants strongly depend on export. Under the impact of the sales crisis, sawmills were pushed to react to the increasing stocks by reducing their production. Many smaller facilities even ended up closing the entire production. Alternative markets (Japan, China, Australia, etc.) do not manage to cover the deficit from the side of the USA and the EU. Lower production, mainly in constructions, reflected in a significant year-on-year drop in the national consumption of softwood sawn wood (by 1.284 million m³).

At the end of 2009, timber processing company LESS – TIMBER opened a new sawmill in Čáslav and increased its capacity to 460 thousand m³/year. This ranks the company among the largest timber processors in Europe, along with ENSO TIMBER ŽDÍREC, s.r.o., STORA ENSO TIMBER PLANÁ, s.r.o. and Mayr – Melnhof Holz Paskov s.r.o. As to the production of agglomerated material, companies KRONOSPAN CR, s. r.o. in Jihlava and Dřevozpracující družstvo Lukavec in Lukavec retained also in 2009 their position as the largest and most significant producers in the Czech Republic.

The total softwood and hardwood roundwood processed in the Czech Republic amounted to 6.700 million m³, which was used to produce 3.8 million m³ of softwood sawn timber and 248 thousand m³ of hardwood sawn timber. This represents a year-on-year decrease in all sawn timber production by 588 thousand m³. Export of softwood and hardwood sawn timber increased by 846 thousand m³. Compared to 2008, there was a drop in the production of particle boards (by 508 thousand m³) and fibre boards (by 36 thousand m³).

The domestic consumption of wood – wood products – is still significantly behind; for example, the annual consumption of wood per capita in the USA and Japan is 150% higher than in the Czech Republic and the use of wood in construction represents only one fifth of the figures in the neighbouring countries (Germany and Austria). Timber is rarely used for house construction in the Czech Republic.

Roundwood and sawn wood production (1 000 m³)

	2007	2008	2009
Roundwood	8 700	7 650	6 700
Sawn wood	5 454	4 636	4 048

Source: Ministry of Agriculture.

Timber products market (1 000 m³)

Product	Year	Production	Import	Export	Consumption
	2007	10 004	578	2 300	8 282
Softwood roundwood*	2008	8 503	548	1 825	7 226
	2009	8 332	416	2 514	6 234
	2007	500	286	64	722
Hardwood roundwood*	2008	425	203	81	547
	2009	520	122	82	560
	2007	5 187	389	2 262	3 314
Softwood sawn wood	2008	4 409	387	1 897	2 899
	2009	3 800	558	2 743	1 615
	2007	267	168	46	389
Hardwood sawn wood	2008	227	167	63	331
	2009	248	409	292	365
	2007	1 428	351	1 017	762
Particle boards	2008	1 436	345	1 029	752
	2009	928	288	1 042	174
	2007	175	65	105	135
Plywood	2008	149	59	45	163
	2009	175	70	141	104
	2007	94	271	89	276
Fibreboards	2008	80	251	78	253
	2009	44	223	82	185
	2007	5 864	200	550	5 514
Softwood pulpwood **	2008	4 984	131	402	4 713
	2009	4 556	1 000	1 600	3 956
	2007	370	21	100	291
Hardwood pulpwood	2008	395	20	86	329
	2009	361	20	65	316

Note: *Including poles and mining timber.

** Including groundwood.

Source: Ministry of Agriculture.

8.3 Pulp and Paper Industry

The consumption of timber for pulp production reached 3 325 thousand m³ of softwood timber, i.e. 2 270 thousand m³ of softwood pulp and 1 055 thousand m³ of softwood chips and particles.

Pulp and paper industry produced total 732 thousand tons of pulp in 2009, wood pulp representing 728 thousand tons. Compared to 2008 (total 702 thousand tons), the production of chemical pulp increased by 49 thousand tons and mechanical pulp dropped by 19 thousand tons.

According to the CEPI classification, the production of paper, paperboard and cardboard used in pulp and paper industry noted a decrease by approximately 12.9% compared to 2008 and amounted to total 805 thousand tons. Nevertheless, 758 thousand tons were exported,

i.e. 94.5% of the total volume. The domestic consumption had to be secured by export of 1 208 thousand tons. The total domestic production involved 79% of packing and wrapping paper and cardboard, only 16% of graphic paper and 5% of sanitary paper. In contrast to the Czech Republic, the CEPI (Confederation of European Paper Industries) countries produce 50% of graphic paper, 40% of packing and wrapping paper and 10% of sanitary paper.

The structure of production in the Czech pulp and paper industry still does not reflect the domestic demand. We export half of the pulp production and, on the contrary, we import short fibre pulp, which is not produced in our country. As to paper, paperboard and cardboard, the Czech Republic mainly exports goods with a lower value added (packing and wrapping paper) and mostly imports expensive graphic and printing paper. This also results in significant losses in the balance of the foreign trade.

The total consumption of paper, paperboard and cardboard in the Czech Republic decreased against 2008 to 1 255 thousand tons. The necessary import reached 1 208 thousand tons and export 758 thousand tons. The development in paper consumption (including paperboard and cardboard) per capita is considered as an indicator of the cultural level and living standard of a country. After the boom which continued until 2007, the year 2009 brought another partial drop in the period of sales crisis (the consumption was 130 kg per capita in 2004, 150 kg per capita in 2007, 144 kg in 2008, and dropped down to 120 kg in 2009).

Pulp, paper and paperboard production (1 000 t)

Product	2007	2008	2009
Mechanical pulp	85	46	27
Chemical pulp	692	652	701
Pulp of other fibres	3	4	4
Total	780	702	732
Paper and paperboard	1 023	932	805

Source: Association of Pulp and Paper Industry, Czech Statistical Office.



II. ABBREVIATIONS AND GLOSSARY

AOPK/AOPK ČR	Agency for Nature Conservation and Landscape Protection of the Czech Republic
CEPI	Confederation of European Paper Industries
COST	European Cooperation in Science and Technology
CZK	Czech koruna (currency)
ČSOP	Czech Union for Nature Conservation
EFI	European Forest Institute
EIA	Environmental Impact Assessment
ERMA	Internet Application of ÚHÚL
EU	European Union
EUFORGEN	European Forest Genetic Resources Programme
EUR	Euro (currency)
FD	Forest District – LČR organisational unit
FGMRI	Forestry and Game Management Research Institute (VÚLHM)
FMI	Forest Management Institute (ÚHÚL)
FMP	Forest Management Plan
FRM	Forest Reproductive Material
FSC	Forest Stewardship Council
GDP	Gross Domestic Product
HRDP	Horizontal Rural Development Plan of the Czech Republic

ICP - FOREST	International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests
IF	Impact Factor
ISTA	International Seed Testing Association
IUFRO	International Union of Forest Research Organizations
LČR/LČR, s.p.	Lesy České republiky, s.p. (Forests of the Czech Republic, State Enterprise)
NACE	Classification of Economic Activities in the European Union
NFP	National Forest Programme
PEFC	Programme for the Endorsement of Forest Certification Schemes
R&D	Research and Development
RDP	Rural Development Programme
SEA	Strategic Environmental Assessment
ÚHÚL	Ústav pro hospodářskou úpravu lesů Brandýs nad Labem (Forest Management Institute – also referred to as the 'FMI')
USA	United States of America
VLS	Vojenské lesy a statky ČR, s.p. (Military Forests and Farms, State Enterprise)
VÚLHM	Výzkumný ústav lesního hospodářství a myslivosti, v.v.i. Strnady (Forestry and Game Management Research Institute, also referred to as the 'FGMRI')



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