

REPORT ON FORESTRY IN THE SLOVAK REPUBLIC 2006  
**GREEN REPORT**



Bratislava, November 2006

Ministry of Agriculture of the Slovak Republic

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## PREFACE

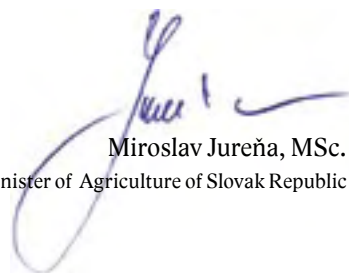
Dear readers,

Report on Forestry in the Slovak Republic, better known as Green Report has been already the 14<sup>th</sup> one. The Ministry of Agriculture of SR in collaboration with the National Forest Centre in Zvolen presents in the Green Report the situation in forestry in Slovakia as well as forecasts its development for the future.

The development of civilization brings about changes in the ideas and views of people about the quality of life. Requirements of the society on the environment, especially forests, are closely connected with that. We are aware of new demands of the society on forest functions whereas forest ecosystems have been stressed as a phenomenon of nature. There are adopted measures to ensure sustainable forest management that should guarantee wood production as well as benefits for the people.

Within international collaboration the Green Report is provided to international organizations, experts and institutions of the European Union. The publication has found its place also at international forestry conferences as it presents in a complex and standard way the analysis of the situation and development of forestry in Slovakia.

I am very glad to present you this publication and believe it will be an important source of complex information and good assistant for all who are by their profession or interests tied up with forests.



Miroslav Jureňa, MSc.  
Minister of Agriculture of Slovak Republic



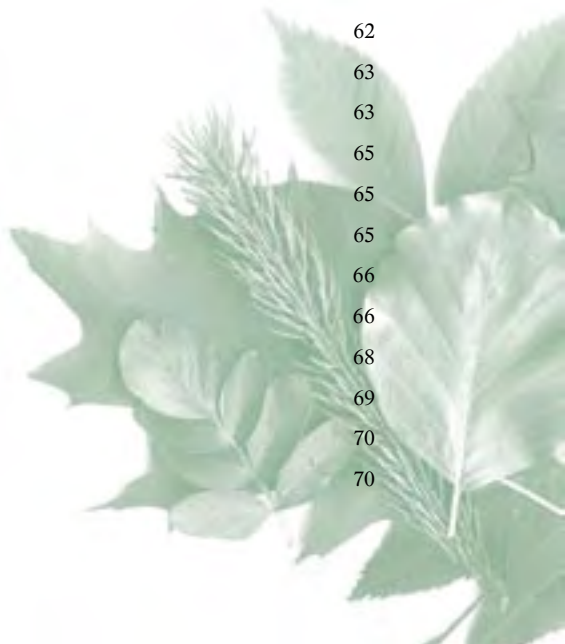




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## 1. POSITION OF FORESTRY WITHIN THE ECONOMY OF SLOVAK REPUBLIC

### 1.1 General macro-economic conditions of Slovak Republic

The Slovak Republic economy has recorded some progress already the second year after accession into the European Union under relatively favourable conditions of revival of European economy. The development of the SR economy reached the value 1 440 billion SKK in 2005. Its increment represented 8.6% in the prices of current year in comparison with the year 2004. It was lower by 2.2% in comparison with the year 2004. Regarding the lowest inflation in the history of Slovakia (2.7%) a real increment of GDP was higher in comparison with 2004 by 0.6% and represented 6.1%. The achieved economic growth in the Slovak Republic was double of the average in EU–25 and altogether with the Czech Republic the highest for new member countries of the EU (EU–10). From production viewpoint the growth of GDP was connected with more marked growth of gross added value (GAV) in production branches ranging from 8.7% up to 15.6% and in non-production sectors from 0.4% up to 14.7%. Foreign demand has dropped in comparison with previous year by 0.5% to 10.9%, and it was partially saturated by an increase of domestic demand by 1.8% to the value 7.3%. Negative balance of foreign trade of the year 2004 has increased by 61.7% to –76 billion SKK. But negative balance of the state budget has dropped significantly, namely by more than 50% to –33.89 billion SKK and it represented only 2.35% of GDP (table 1.1 – 1).

Higher performance of the economy enabled to maintain a favourable trend in the development of employment rate. The employment rate has increased by 1.8%. Positive turn was recorded also in the development of unemployment rate that dropped in 2005 when compared with previous year by 1.9% to 16.2%. Mainly industry sectors, sector of social services, trade, sector of construction and agriculture contributed to the lowering of unemployment rate. Average monthly nominal wage of an employee in the national economy of SR has increased in 2005 by 9.2%, what was less by 1.0% in comparison with 2004. With regard to low inflation there was recorded more marked increase of real wage by 3.8% to its average value of 6.5%. In forest sector the increase of nominal wage was 8.6% and real wage 5.9%. Already for the second year there was recorded an increase of nominal as well as real price of labour in forestry, despite that it was smaller by 0.6% than in the economy of SR. It means that existing disparity was reduced only partially.

The creation of gross capital in SR has recorded an increase again after two years of recession. Gross capital has increased by 7.9% to 378 billion SKK mainly due to investments of a foreign capital into car factories, other industry and partially also into highway network. The proportion of forestry in the macro-economy of SR was growing also in 2005 thanks to the sale of calamity wood. With 8.6% growth of the GDP of the economy of SR in current prices also its proportion has increased by 0.05% to 0.59%. Monetization of domestic market production of wood in wood industry represented in the year 2005 about 20.7 billion SKK, i.e. 1.4% of GDP. The proportions of forest sector and wood industry sector, including the benefits from public beneficial forest functions would mean 3.03% proportion in the GDP of SR in the year 2005.

The development of the economy of SR in 2005 was influenced positively also by uniform tariff of taxes. Collection of taxes has improved significantly and at the same time their

proportion from legal entities as well. Income tax of private persons has dropped by more than 20 billion SKK. Expected increase of prices on goods after accession into EU has not occurred. In 2005 the prices were stabilized, what was confirmed also by the lowest inflation (2.7%) in that year compared with previous one. The forest sector in SR has been characterized already the fourth year by recession at timber market in Europe enhanced by high growing stock (wood supplies) from wind calamities. Average timber monetization has dropped by 7% in comparison with previous year. Average prices on coniferous assortments have dropped already by 13% while average prices of broadleaved assortments have increased by 3%.

Table 1.1 – 1 Basic macroeconomic indicators of the economy in SR and in forest sector of Slovak Republic

Indicator	Measurement unit	Year				Assumption 2006
		2002	2003	2004	2005	
GDP in current prices	Million	1 073	1 196	1 325	1 440	1 565
– of that forestry	SKK	5.0	5.6	7.1	8.4	7.0
GDP increment in constant prices of the year 1995	%	4.4	4.2	5.5	6.1	6.2
Investments in current prices	Million	360 500	350 050	349 000	376 736	406 600
– of that forestry	SKK	651	582	514	932	800
Employees	Ths	2 127	2 164	2 170	2 216	2 250
– of that forestry	persons	20	18	15**	13**	14**
Average monthly wage	SKK	13 511	14 365	15 825	17 274	18 900
– of that forestry		11 571	12 712	14 309	15 543	16 900
Inflation rate	%	3.3	8.5	7.5	2.7	4.3
Unemployment rate	%	18.5	17.4	18.1	16.2	15.5
Foreign trade balance	Billion	–96.6	–23.6	–47.0	–76.0	–50.0
State budget balance	SKK	–51.6	–55.9	–70.3	–33.89	–30.0
Bank rate	%	6.5	6.25	6.0	3.2	3.0
Interest rate*	%	5.5/10.0	5.05/5.99	4.9/5.5	1.62/6.56	1.7/6.0
Rate (mean)	SKK/USD	45.3	36.8	34.0	31.0	29.5
Rate (mean)	SKK/EUR	41.5	41.5	39.9	38.6	35.5
Growth of aver. nominal wage	%	9.3	6.3	10.2	9.2	7.8
Growth of average real wage	%	5.8	–2.0	2.5	6.5	3.3

Source: Lesnícky výskumný ústav (FRI Zvolen) and ŠÚ SR (Statistical Office of the Slovak Republic)

Explanatory note: GDP – gross domestic product

\* Aver. interest rate of deposits / Aver. interest rate of credits

\*\*They are the employees in the subjects managing forests; entrepreneurial subjects providing services for forest owners and forest users had other about 10 thousand employees in 2004 a 12 thousand in 2005

## 1.2. Position of forestry in the national economy of Slovak Republic

In 2005 the sale of wood from processed calamity of 2004 contributed to the growth of GDP of forest sector by almost 1.8 billion SKK. The volume of timber sale was higher by almost 2.1 million m<sup>3</sup>. It resulted from higher felling by about 60% than its model value for last ten years. The value of forestry GDP was higher by 18.3% in 2005 than in previous year. It caused the increase of the proportion of the forest sector of SR in the GDP of the economy of SR by 0.05% to the value 0.59%.

In the year 2005 also great investments into forest property and forest production were recorded. The investments increased by 81.3% and their proportion in the investments of the economy of SR has increased by 0.10% to the value 0.25%.

The proportion of the employees in forestry had dropped in comparison with previous year by 0.10%

The number of registered forest sector employees has dropped by about 2 thousand, mostly due to movement of these employees to entrepreneurial sphere that provides services for forestry. Also the rise of employment rate in the economy of SR has contributed to this drop. Rate of decrease has grown also due to the increase of employment rate in the economy of SR. In 2005 the employment rate, it means number of persons working in forest sector of SR, has increased actually, with regard to the implemented volume of performances in felling as well as other activities. With regard to inadequate registering and documenting the employment in the set of entrepreneurial subjects, who provide services to state as well as non-state forest sector, we can suppose that in 2005 there were employed in entrepreneurial sphere about 12 000 thousand employees in various positions.

Even in 2005 a long-term unfavourable development of the disparity of labour price and the growth of average monthly salary has not improved when we compare forest sector of SR and the whole economy of SR. Average monthly salary in forest sector was also in 2005 lower by 1 731 SKK in comparison with average monthly salary in the economy of SR. This difference has slightly increased by 0.44%.



Figure 1 Proportion of forestry in gross domestic product of Slovak Republic grows

Table 1.2 – 1 Development of some indicators in the forestry of Slovak Republic

Indicator	Measure- ment unit (Mu)	Year							
		1990		2003		2004		2005	
		(Mu)	%	(Mu)	%	(Mu)	%	(Mu)	%
GDP in current prices	Billion SKK	278.5	100	1 196	100	1 325	100	1 440	100
– of that forestry		2.7	0.97	5.6	0.47	7.1	0.54	8.4	0.59
Investments	Million SKK	69 741	100	350 050	100	349 000	100	376 736	100
– of that forestry		553	0.79	582	0.17	514	0.15	932	0.25
Employees	Ths persons	2 459	100	2 164	100	2 170	100	2 216	100
– of that forestry		36	1.47	18	0.83	15	0.69	13	0.59
Average monthly wage	SKK	3 278	100	14 365	100	15 825	100	17 274	100
– of that forestry		3 419	104.3	12 712	88.49	14 309	90.42	15 543	89.98

Source: FRI Zvolen

In 2005 forest sector of SR transferred into the national budget taxes at the amount of about 1.6 billion SKK. Private persons and legal entities paid payments to social insurance companies and to other funds about 1.0 billion SKK. As receivables we can classify unsettled financial relations in form of detriment arising for the forest owners and managers due to applying some acts (e.g. Act no. 543/2000 of the Digest on nature and landscape conservation) or due to decisions of the organs of state administration. The amount of these receivables reaches about 1.3 billion SKK per year. Also damages following from air pollution and other anthropogenic damage to forests form an important item. Their annual volume is estimated at more than 500 million SKK.

In 2005 timber sale of the forest sector reached 82.4% of its total sales and revenues. Timber felling has increased by 40.5% in comparison with previous year, and timber sale by 28.5%. Returns from timber sale have risen only by 19.9%. Average monetization of timber has dropped by 7.0%. Increase of timber sale, even with reduced monetization due to it mostly calamity origin, enabled to reach positive economic result at total amount 455 million SKK even almost with non-existing support to forestry activity from public sources.

Table 1.2 – 2 Development of some indicators characterizing the interrelation of the forestry of Slovak Republic and the state budget

Indicator		Actual state in (million SKK)				Assumption for 2006
		1990	2003	2004	2005	
Sales and revenues		4 531	10 555	11 484	13 779	11 200
Costs		4 326	10 828	10 632	13 061	10 819
Economic result (profit +, loss –)		205	–273	852	455	280
State subsidies for forestry		1 007	221	21	25	30
Share in sales and revenues in %	Profit	4.52	–2.59	7.42	3.30	2.50
	State subsidies	22.22	2.09	0.18	0.18	0.27

Source: FRI Zvolen, Ministry of Agriculture of SR







## 2. ORGANIZATIONAL AND INSTITUTIONAL STRUCTURE OF THE FORESTRY OF SLOVAK REPUBLIC

### 2.1. State administration of forestry and state supervision in forests

#### 2.1.1. Central organ of state forestry administration

**M**inistry of Agriculture of the Slovak Republic is a central organ of state administration of forestry. The ministry through Forestry Section participates in the implementation of state forest policy, performs state administration of forestry and works out strategic concept and documents for forestry. An important part of the activities of the Ministry was control and methodical guidance of the organs of local state forest administration on the first level – District forest offices and on the second level – County forest offices.

#### 2.1.2. Organs of local state forest administration

In the year 2005 the organs of local state forest administration carried out within own competencies mainly following actions:

- Lands with the area 883.3 ha were declared forest land (or decided in a controversy whether the land is a part of forest land resources).
- Upon the decision of District forest office they excluded lands with the area 230.6 ha from forest land resources and lands with the area 95.5 ha excluded temporarily.
- Upon the decision of District forest office restricted the use of forest lands for fulfilment of forest functions permanently on the area of 77.1 ha and temporarily on the area of 12.7 ha.
- Evaluated the results of works in silviculture in 6 596 units of spatial forest arrangement with the area 5 329 ha.
- Imposed fines in accordance of valid forestry legislation state forest organizations, non-state forest subjects and other subjects at the amount 2 158 thousand SKK. The amount of paid fines was 622.1 thousand SKK, i.e. 28.8%.
- Prolonged periods for reforestation of clearings on forest lands with the area 621.0 ha and periods for securing forest stands on lands with the area 218.4 ha.
- Decided about the change of prescription of forest management plans (FMP) in 1 088 units of spatial forest arrangement, of that they have not permitted the change of FMP prescription in 65 units of spatial forest arrangement.
- Granted exceptions on some prohibited activities in forest in 1 440 cases.
- Performed inspections of the fulfilment of FMP prescriptions during the validity of FMP in 1 243 units of spatial forest arrangement and after expiring the validity of FMP in 3 566 units of spatial forest arrangement.
- Performed thematic inspections (supervision) in 1 483 units of spatial forest arrangement.
- Performed basic round prior to elaboration of FMP in 215 forest user's units with the area 157.8 thousand ha and final round in 140 forest user's units with the area 145.5 ths ha.



- Upon decision they approved forest management plans in 150 forest user's units and determined 194 new forest user's units with the area 223.2 thousand ha.

### 2.1.3 Forestry legislation

In the year 2005 there were adopted and came into effect following forestry related legal norms:

- Forest Act no. 326/2005 of the Digest
- Decree of the government of Slovak Republic no. 86/2005 of the Digest on raw timber classification
- Regulation of the Ministry of Agriculture of Slovak Republic no. 38/2005 of the Digest on the valuation of lands and stands on them for the purposes of land arrangement
- Act no. 193/2005 of the Digest on plant medicinal care
- Decree of the government of Slovak Republic no. 177/2005 of the Digest that amends the Decree no. 64/2004 of the Digest on protection zones
- Act no. 562/2005 of the Digest that amends the Act no. 314/2001 of the Digest on fire prevention
- Regulation of the Ministry of Interior of the Slovak Republic no. 591/2005 of the Digest that amends the Regulation no. 121/2002 of the Digest on fire prevention

## 2.2. Ownership and use of forests

### 2.2.1 Structure of the ownership and use of forests

Current structure of the ownership and use of forests in Slovak Republic is presented in table 2.2.1 – 1.

Table 2.2.1 – 1 Structure of forests (stand area) according to their ownership and use

Subjects	Area of stands (ha)				Proportion in 2005 (%)	
	To 31 Dec 2004		To 31Dec 2005		Ownership	Use
	Ownership	Use	Ownership	Use		
State	811 935	1 146 259	807 753	1 130 786	41.8	58.5
Non-state, of that:	1 014 091	784 433	1 011 096	800 859	52.3	41.5
– Private	282 839	119 938	275 243	121 372	14.2	6.3
– Community	470 900	443 636	480 160	459 162	24.9	23.8
– Churches	66 642	48 253	65 242	47 449	3.4	2.5
– Agricultural cooperatives	3 208	4 793	2 635	4 106	0.1	0.2
– Municipal	190 502	167 813	187 816	168 770	9.7	8.7
Unknown	104 666	—	112 796	—	5.9	—
Together	1 930 692	1 930 692	1 931 645	1 931 645	100	100

Source: Summary data on the forests in SR

We can see in table 2.2.2 – 1 that the settlement of the forests ownership and use pursuant to restitution acts has not been completed yet. Non-state subjects who have legally settled

their ownership rights own 52.3% of all forests in Slovakia. In the use of non-state subjects is 41.5% of total area of forests in Slovakia. The highest proportion of not returned forests (returned only 6.3% of the total 14.2%) is in private forests. The reason is the fact they are mostly forest lands of small size with a lot of small individual owners or shared ownership being impossible to identify in the forest. Moreover, there are owners of forest lands who due to various reasons did not request for their restitution.

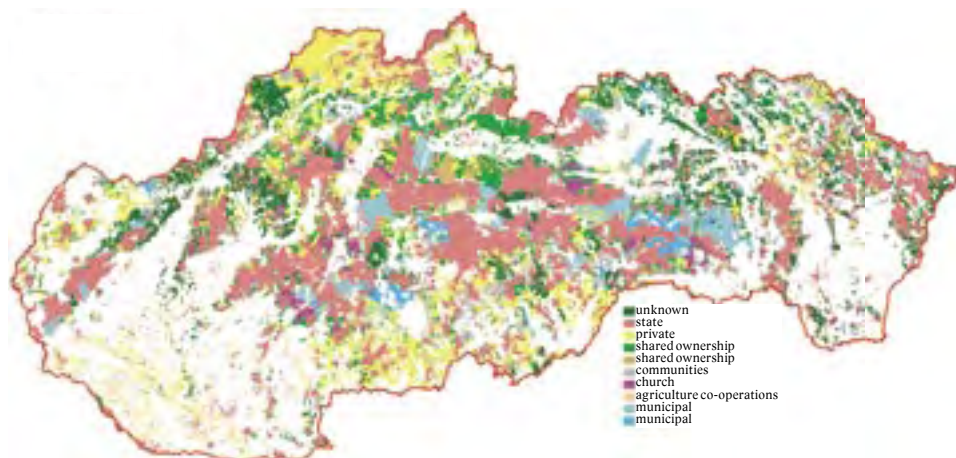


Figure 2 Forest ownership

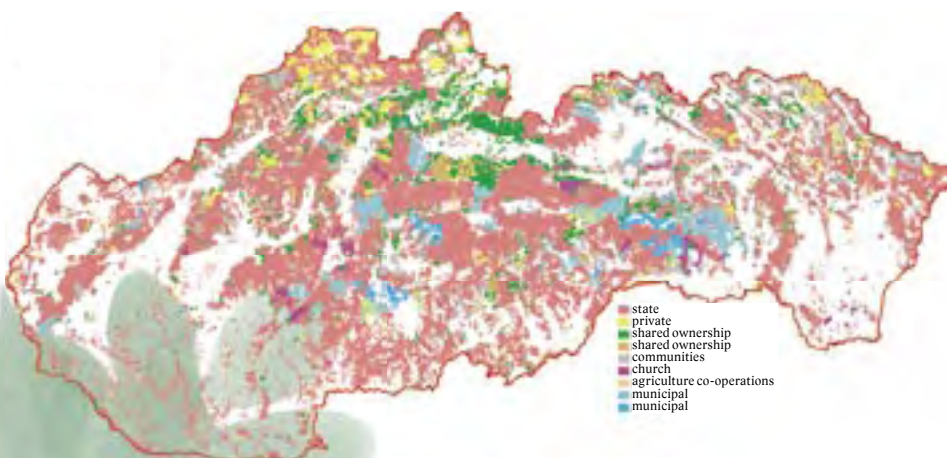


Figure 3 Forest use

In the year 2005 state forest enterprise Lesy SR, š. p., handed over to former owners 10 954 ha of forest lands, of that 3 781 ha to private owners, 4 809 ha to land partnerships, 1 423 ha to churches and religious communities, 679 ha to towns and municipalities and 262 ha to other subjects. The trend of the restitution of the ownership's rights and the use of forest land by non-state subjects has been stagnating since 1997 (on average it is only 10 thousand ha per year). Completion of this process will be possible only after eliminating existing legislative, technical and economic barriers.

### 2.2.2. State forest

Forest lands in the ownership of the state are managed by following state forest enterprises: National State Forest Enterprise – Lesy SR, š. p., Banská Bystrica, Forestry and Agricultural Estate, state enterprise Ulič (Lesopolnohospodársky majetok Ulič, š. p.), State forests of Tatra Mts. National Park – ŠL TANAP. All these organizations are subordinated to the Ministry of Agriculture of the SR. Military Forests and Estates of SR (VLM SR), š. p., Pliešovce are subordinated to the Ministry of Defence of SR. State forest organizations manage also the forest lands of the owners who have not returned their lands due to various reasons, as well as the forests leased from non-state subjects.

For the field education of students Lesy SR, š. p. Banská Bystrica put on lease through contract 913 ha of forests to Secondary Forestry School in Banská Štiavnica, 392 ha to Secondary Forestry School in Prešov and 10 688 ha of forest lands to School Forests Enterprise at the Technical University in Zvolen (SLŠ, TU). Secondary Forestry School Lip-tovský Hrádok carries out field education on the basis of the contract with Lesy SR, š. p., Banská Bystrica.

Table 2.2.2 – 1 Basic data on the forests managed by state forest organizations

State forest organizations	Area of stand land, ha	Growing stock, ths m <sup>3</sup>	Growing stock of mature stands, ths m <sup>3</sup>	Areas of mature stands, ha
Lesy SR, š. p.	989 529	225 373	66 237	169 879
ŠL TANAP	38 598	7 699	670	1 859
LPM Ulič, š. p.	20 789	4 132	875	2 345
VLM SR, š. p.	69 552	14 791	5 127	15 312
SLŠ, TU	12 318	3 269	1 362	2 852
Together	1 130 786	255 264	74 271	192 247

Source: Summary data on the forests in SR

### 2.2.3. Non-state forests

Non-state forest sector comprises private forests, community forests, forests of churches, of agricultural cooperatives and municipal forests. Legal and organization form of the subjects in non-state sector form land partnerships with and without legal subjectivity, limited liability companies, joint stock companies, private persons registered for enterprising or without registration as well as special organs (economic or allowance organizations) of a municipal office. Basic data on the forests used by the subjects of non-state forest sector are presented in following table.

Table 2.2.3 – 1 Basic data on forests in the use of non-state sector subjects

Subjects	Area of stand land, ha	Growing stock, ths m <sup>3</sup>	Growing stock of mature stands, ths m <sup>3</sup>	Area of mature stands, ha
Private	121 372	29 703	9 913	24 745
Community	459 162	100 554	26 828	71 993
Churches	47 449	10 989	2 934	7 780
Agricultural cooperatives	4 106	875	290	887
Municipal	168 770	41 521	12 926	30 884
Together	800 859	183 642	52 891	136 289

Source: Summary data on the forests in SR

### 2.2.4. Entrepreneurial sphere

The trend of the increase of the proportion of performances implemented by entrepreneurial subjects continued also in 2005. The proportion of the works on contract in main forestry activities ranged from 77% in artificial forest regeneration to 97% in timber skidding.

*Figure 4 Volume of services provided by entrepreneurial subjects is increasing*



*Table 2.2.4 – 1 Trend of performances implemented by entrepreneurial subjects in state forest enterprise Lesy SR, š. p., Banská Bystrica*

Year	Artificial regeneration		Protection of forest stands		Cleanings		Timber felling		Timber skidding		Timber transport	
	ha	%	ha	%	ha	%	ha	%	ha	%	ha	%
2000	571	11	706	2	5 978	31	1 381	42	1 454	45	207	6
2004	3 714	85	28 729	87	15 835	89	3 234	87	3 224	89	742	21
2005	3 954	57	29 916	93	16 073	96	4 224	95	4 187	97	2 729	69
Index 2005/2000	6.9		42.4		2.7		3.1		2.9		13.2	

*Source: Lesy SR, š. p., Banská Bystrica*

## 2.3. Professional forestry organizations

### 2.3.1. Forest Research Institute Zvolen

Main mission of Forest Research Institute (FRI) Zvolen was to obtain new scientific knowledge on forest ecosystems and their management through solving and securing following groups of tasks:

*Table 2.3.1 – 1 Group of tasks secured by FRI Zvolen in 2005*

Character of tasks	Group of tasks	Proportion in the tasks of FRI, %
Research tasks	Scientific programmes	7.1
	Projects supported by APVV	16.2
	Tasks secured within the Contract between Ministry of Agriculture of Slovak Republic and FRI Zvolen	21.5
	International projects	1.3
	SOP projects	4.6
Non-research tasks	Non-research tasks being secured on contract between Ministry of Agriculture of Slovak Republic and FRI Zvolen	39.7
	Other tasks and activities being secured within special contracts	9.6

*Source: Forest Research Institute Zvolen*

*Explanatory notes: APVV – Slovak Research and Development Agency; SOP – Sectoral Operational Programme*



Regarding research activity FRI participated in 6 scientific programmes with total costs 6.1 million SKK. Within the projects of the Agency for the Support to Science and Research the Institute solved 12 tasks with total costs 15.2 million SKK. The most important research and development tasks solved on contract were as follows: The effect of global climatic change on the forests of Slovakia (15.0 million SKK) and Reconstruction of non-autochthonous forest communities endangered by the change of natural conditions what would result in ecologically more stable ecosystems (5.5 million SKK). FRI solved also 7 international programmes and projects.

For the needs of state forest administration FRI Zvolen elaborated in 2005 expert opinions and data for their decision. In the cooperation with the Ministry of Environment of SR and its subordinated organizations – Slovak Agency of Environment, State Nature Protection



– they worked on solving the issues of NATURA 2000 implementation. An important activity was working out projects for eliminating the consequences of wind calamity in November 2004. FRI Zvolen cooperates also with the Ministry of Justice of SR as an “expertise institute” for the valuation of forests and in the field of forestry.

*Figure 5 Edifice of the Forest Research Institute in Zvolen*

### 2.3.2. Lesoprojekt Zvolen

The primary task of the Institute was working out of forest management plans (FMP). The staff of its 4 branch offices and their network of field offices met obligations related to planning activities. New FMPs were supplied for the total area of 189.5 thousand ha of forest or 171 forest user's units. 2005 FMP survey covered 145.3 thousand ha; a comprehensive forest survey covered 173.2 thousand ha, out of which 135.9 thousand ha were output-level processed. Private mensuration offices managed FMP survey on the total forest area of 30.5 thousand ha (45 forest user's units).

The Lesoprojekt Zvolen further provided services and the evidence base for the Slovak forestry practice and research in the following areas:

- Forest planning (methodological support, guidelines for sustainable forest management, forest projections, innovation)
- Forest ecology survey
- Forest mapping (administration, review, publishing and storage of the national map set – forestry thematic layer including large-scale thematic mapping for FMP)
- Forestry statistics and applied forestry software (development and maintenance of the National Forestry Information System, the National Forestry Database, custom-made software packages)
- Forest certification

- Industry support and consultancy (analyses, case studies, forest appraisals, planning assessments, tailor-made projects, etc.)

The Institute employed 316 staff – 97 at the Lesoprojekt Headquarters in Zvolen and 219 at its branch offices.

### 2.3.3. The Institute for Training and Education of Forestry and Water Management Staff of the Slovak Republic

The Institute performed on the basis of the contract with the Ministry of Agriculture of Slovak Republic activities aimed at education and training of the employees in the sector of forestry and water management, carried out training programmes in cooperation with foreign partners as well as fulfilled the assigned tasks in the field of secondary vocational education.

By merging of these three organizations there was established on 1 January 2006 a new allowance organization National Forest Centre with the seat in Zvolen.

### 2.3.4. Other organizations financed from the state budget working in forest sector

#### *Museum in Svätý Anton*

A unique exhibition on hunting in whole Slovakia is placed in the museum. The exposition includes many items on falconry, its history and presence, fishing, cynology, historical guns, hunting and game in paintings, trophies and dioramas with game in its natural environment. In the precincts of the manor house, where the museum is located, every year in the beginning of September there are held “Days of St. Hubert” as a national festival of hunters and all friends of nature.



*Figure 6 Manor house in Svätý Anton hosts an annual national gathering of hunters and nature enthusiasts*

#### *Forestry and Wood Technology museum Zvolen*

The museum is aimed at documenting forestry and woodcutting and wood processing and at the same time at ethnographic documentation of Zvolen region. In addition to its permanent exhibition entitled “Bitterness and beauty of wood” in 2005 it organized 20 temporary exhibitions and 9 short-term presentations. It prepared in the cooperation with FRI Zvolen and State forests TANAP travelling photo exhibition “Calamity in Tatra Mts. seen by heart and intellect”.



In the course of the festival ENVIROFILM 2005 the museum prepared a review of historical films under the title “Transportation of timber in forest in the past”. It organized also traditional events as the 7th year of Slovakian competition “Etudes from wood” – the competition for the best wood utility object and jewellery item as well as the 5th year of documentary photography competition for youth on the topic “Forest”.

## 2.4. Interest organizations and associations

### 2.4.1. Slovak Forestry Chamber

Slovak Forestry Chamber has currently 255 members including group membership (legal entities). The activity of the Slovak Forestry Chamber was aimed mainly at working out standpoints to the documents and decisions of central organs of state administration and at elaboration of initiatives proposals to solve the situation in the forestry of Slovakia.

### 2.4.2. Associations of non-state forest owners

In the year 2005 there were working 4 non-state forest owners associations who associated owners with total area of forest lands 536 132 hectares. Non-state forest owners who own forests with the area 264 727 hectares, what is 33% of the total area of forests of non-state forest owners, are not member of any association.

The activities of the associations in 2005 were aimed mainly at education and training of own members on supportive programmes (SAPARD, Sectoral Operational Programme, Rural Development), courses on the issues of taxes, accounting and identifying the ownership. They elaborated own opinions and comments to the concepts and documents on forestry of SR, mainly on eliminating calamity of November 2004.

### 2.4.3. Association of the employers in the forest sector of Slovakia

The Association comprised in 2005 19 following organizations: 2 state forest enterprises, 3 Lesostav companies, 9 corporations of municipal forests, 2 school forest enterprises and 3 allowance organizations.

### 2.4.4. Slovak Hunters' Union

The Union associates more than 50 thousand hunters in 1 356 hunters' associations what means it is one of big interest organizations in Slovakia. But in comparison with 2004 the number of hunters' associations has dropped by 34. The Union participated actively in the preparing legal norm related with game management and hunting and worked out also a new version of the act on game management. District and regional organizations of the Union collaborated closely with local state administration of game management. They organized breeding exhibitions of game trophies. In the cooperation with State Veterinary and Food Administration they secured measures aimed at improvement of the health con-

dition of game. The Union organized tests and exhibitions of breeding and use of hunting dogs. It directed top cynological events on national as well as international level. It was very active also in hunting shooting and in professional preparation for the performance of hunting right. In 2005 the Union was a main organizer of national hunting exhibition Hunting and Nature held in Nitra that was an important event from international viewpoint as well.

An important part of the activities of the Union is work with youth. It is mainly activity of clubs of young friends of hunting. In 2005 943 pupils from elementary schools worked in such clubs. They learnt about nature and game protection and thus their positive attitude to nature and hunting enhanced. The Union secured in addition to professional guidance of the clubs, insurance of the members of the clubs, methodical and material assistance and organized traditional district competitions as well as national competition of the best members from all clubs.

#### 2.4.5 Council of Economic and Social Partnership in the Forestry of Slovak Republic

The Council was established in 2005 as a succession organization of the Council of economic and social agreement in the forestry of SR. It is composed of three representatives from each partner, namely the Ministry of the Agriculture of SR, the Association of the Employers in Forestry and the Trade Union of the Employees of Wood Industry, Forestry and Water Management in Slovakia.

#### 2.4.6 Association of Forest Certification of Slovakia

This association represents a national directive organ of PEFC certification system (PEFC – Programme for the Endorsement of Forest Certification Systems) in Slovakia.

It was established as an interest association of legal entities, and at the 6<sup>th</sup> General Assembly of PEFC in Luxembourg in 2002 it was accepted a proper member of the PEFC Board. Currently the Association has 16 members who are divided into three chambers of forest users, subjects processing wood and other interest groups.

In the collaboration with FRI Zvolen, Union of Regional Associations of the Owners of Non-State Forests of Slovakia and Confederation of European Forest Owners (CEPF) there was organized seminar in September 2005 on Certification of Non-State Forests of Slovakia to present to Slovak participations experiences from some European countries. The representatives of the Board of PEFC Luxembourg, PEFC Czech Republic as well as PEFC Austria participated in this seminar. In relation to this seminar later there were organized in the cooperation with the regional association of the forest owners of the regions Považie, Orava and Spiš three information meetings for their members. There were also held seminars for auditors and technical experts for certification of sustainable forest management and certification of consumer's chain of forest products.





### 3. FOREST FUNCTIONS

The new Act No. 326/2005 of the Digest on forests defines forest functions as benefits, services, and influences provided by forests to the society. The act recognises forests as inherent components of natural environment and targets of multiple commercial activities; it introduces two basic categories of forest functions – non-production and production ones. Non-production forest functions, or ecosystem services, primarily cover areas of soil protection, water management and climate moderation. Of equal importance is



*Figure 7 New Act on Forests introduces an obligation to compensate for management constraints*

a whole range of social benefits including health and wellness, nature protection, biodiversity conservation, water purification and recreation. Last but not least, forests provide also an irreplaceable source of cultural, scenic, spiritual and aesthetic values and great outdoors.

With respect to forest functions and their understanding, the most important changes introduced by the act relate to a category of special-purpose forests. They include revocation of air pollution damaged forests as a separate subcategory and inclusion of approved gene reserve forests. In addition, the act introduces obligation to pro-

vide a draft version of special management regime document when applying for special-purpose forest designation as well as the obligation for prior owner or steward consent. At last, it imposes obligation for a restricted ownership rights compensation agreement in cases when claim for special management regime is not supported by the decision of respective state forestry authority or generally binding legal provisions.

#### 3.1 Functional forest categories

Year-on-year increasing demand for forest ecosystem services has led to a gradual decrease in the area of commercial forests. Since 1980, their area has fallen by 9.6% in favour of protection and special-purpose forests better providing for multiple social and environmental benefits. However, it is projected the area of special-purpose forests to decline in the coming years as a result of more complicated designation procedure (obligation to provide a draft version of special management regime and compensation for restricted ownership rights) and revocation of air pollution damaged forests.

Forests available for wood supply are commercial, protection and special-purpose forests except for forests in which natural conditions or legal restrictions limit commercial timber

production. Such forests include forests in protected areas under the 5<sup>th</sup> level of protection, forests in buffer zones of designated water resources, forests in the dwarf pine zone and forests on extreme sites.

Table 3.1 – 1 Forest category area and forests available for wood supply

Forest category	Year									
	1980		1990		2000		2004		2005	
	(Ths ha / %)						(ha / %)			
Commercial	1 439.1	77.3	1 367.1	71.1	1 273.8	66.3	1 294 009	67.0	1 307 723	67.7
Protection	183.8	9.9	258.5	13.5	306.7	16.0	326 536	16.9	327 843	17.0
Special-purpose	187.6	10.1	230.9	12.0	340.9	17.7	310 147	16.1	296 079	15.3
Land base for afforestation	51.1	2.7	65.2	3.4	—	—	—	—	—	—
Together	1 861.6	100	1 921.7	100	1 921.4	100	1 930 692	100	1 931 645	100
Forests available for wood supply							1 746 584	90.5	1 751 164	90.7

Source: Summary data on the forests in SR

## 3.2 Production functions



The new act defines production functions of forests as functions generating benefits of primarily material nature resulting from natural forest growth and associated forest operations. Production of timber and other forest products whilst providing for multiple ecosystem services and benefits is a prime objective of management in commercial forests. These forests currently occupy 67.7% of the total forest stand area or 1 307.7 thousand ha.

In addition to multiple production functions, majority of commercial forests also provide a whole range of environmental and societal benefits (Table 3.2 – 1); provision of these may however in some cases lead to increased management cost and reduced timber yields.

Figure 8 Commercial forests fulfil a multitude of production, ecological and social functions

Table 3.2 – 1 Functional types and their area percent in commercial forests

Function	Functional type	Area (ha)	%
Production	Production	125 347	6.5
	Erosion control-production	669 942	34.7
	Water management-production	129 230	6.7
	Deflation control-production	7 751	0.4
	Recreation-production	512	0
	Nature conservation-production	56 020	2.9
	Air pollution mitigation-production	318 570	16.5
	Game management-production	351	0
Together		1 307 723	67.7

Source: Summary data on the forests in SR 2006

Note: Percent of particular functional type is derived from the total forest area

### 3.3 Ecological functions

All forests regardless of typing provide a multitude of ecological functions. The forests where these are the main management objective are designated as protection forests. Designation and functional typing of these forests is based natural conditions such as gradient, soil conditions, etc.



Figure 9 Protection forests ensure continual fulfilment of ecological functions



Table 3.3 – 1 Functional types and their area percent in protection forests

Function	Functional type	Area (ha)	%
Erosion control	Erosion control	23 803	1.2
	Production-erosion control	20 499	1.1
	Water management-erosion control	14 227	0.7
	Water purification-erosion control	22 456	1.2
	Recreation-erosion control	819	0
	Spa/therapy-erosion control	309	0
	Nature conservation-erosion control	43 802	2.3
	Air pollution mitigation-erosion control	118 233	6.1
	Game management-erosion control	365	0
Together		244 513	12.7
Water management	Water management	676	0
	Production-water management	684	0
	Erosion control-water management	35 965	1.9
	Nature conservation-water management	12 554	0.6
	Air pollution mitigation-water management	23 303	1.2
Together		73 182	3.8
Avalanche control	Avalanche control	92	0
	Water management-avalanche control	2 081	0.1
	Air pollution mitigation-avalanche control	2 500	0.1
Together		4 673	0.2
Bank protection	Bank protection	582	0
	Air pollution mitigation-bank protection	436	0
Together		1 019	0.1
Deflation control	Deflation control	2 634	0.1
	Game management-deflation control	22	0
	Air pollution mitigation-deflation control	1 799	0.1
Together		4 456	0.2
Total		327 843	17.0

Source: Summary data on the forests in SR 2006

Note: Percent of particular functional type is derived from the total forest area

### 3.4 Social functions

Fulfilment of social functions, which to a various degree affect socio-economic well-being of whole communities and businesses, requires special management strategies; these are often significantly different from those applied in commercial forests. Forests primarily managed for social benefits fall under Slovak forest legislation into a category of special-purpose forests. In relation to these forests, the new act introduces term “special management regime”, a draft version of which constitutes an inherent part of the application for special-purpose forest designation. If the regime somewhat restricts lawful ownership rights, the owner (steward) is entitled to financial compensation. In that instance, a compensation claim is lodged against the designation proponent. An agreement is sought on the amount and means of compensation.

Implementation of special management regime often results in the following: loss or reduction of projected timber yields, restricted availability of additional forest benefits and services, and increased management cost when compared to standard methods.

Figure 10 Forests under the strictest level of protection are left to self-propelled natural processes



Table 3.4 – 1 Functional types and their area percent in special-purpose forests

Function	Functional type	Area (ha)	%
Water purification	Water purification	2 886	0.1
	Air pollution mitigation-water purification	13 717	0.7
Together		16 604	0.9
Recreation	Recreation	1 070	0.1
	Production-recreation	19 150	1.0
	Erosion control-recreation	3 420	0.2
	Water management-recreation	1 621	0.1
	Nature conservation-recreation	1 827	0.1
	Air pollution mitigation-recreation	9 143	0.5
Together		36 231	1.9
Spa/therapy	Spa/therapy	304	0
	Production-spa/therapy	764	0
	Erosion control-spa/therapy	2 447	0.1
	Water management-spa/therapy	588	0
	Air pollution mitigation-spa/therapy	565	0
Together		4 668	0.2
Nature conservation	Nature conservation	21 487	1.1
	Air pollution mitigation-nature conservation	35 397	1.8
Together		56 884	2.9
Air pollution mitigation	Air pollution mitigation	1 284	0.1
	Erosion control-air pollution mitigation	79 356	4.1
	Water management-air pollution mitigation	18 576	1.0
	Avalanche control-air pollution mitigation	212	0
	Deflation control-air pollution mitigation	135	0
	Water purification-air pollution mitigation	4 883	0.3
	Recreation-air pollution mitigation	1 021	0.1
	Nature conservation-air pollution mitigation	1 629	0.1
	Production-air pollution mitigation	30 100	1.6
Together		137 196	7.1

Function	Functional type	Area (ha)	%
Game management	Game management	363	0
	Production-game management	12 874	0.7
	Erosion control-game management	10 114	0.5
	Air pollution mitigation-game management	3 563	0.2
Together		26 914	1.4
Education and research	Education and research	8 476	0.4
	Air pollution mitigation-education/research	3 247	0.2
	Other special functions	1 574	0.1
	Air pollution mitigation-other special functions	4 285	0.2
Together		17 582	0.9
Total		296 079	15.3

Source: Summary data on the forests in SR 2006

Note: Percent of particular functional type is derived from the total forest area

### 3.5 Silvicultural systems

The new act introduces a number of major changes to the existing management practices. According to its provisions, clear cutting as a form of planned programme of silvicultural systems throughout the life of the stand is no longer allowed. On top of that, the act introduces a new system called a purpose cut; this system is based on a removal of individual trees to achieve desirable forest stand structure in protection and special-purpose forests for which it is primarily intended. The act also introduces “forest restoration” as a separate regeneration method in forests damaged by natural disturbances, forests with severely reduced increment, thinned and weed-choked forests, forests in need of composition improvement, and conversion forests in which site conditions for natural regeneration are no longer feasible. Forest restoration measures shall always aim at the establishment of site and management appropriate forest structures promoting desired forest values and universal health of forest communities.



Figure 11 On forest plantations, the clearcut, though officially banned, is the only feasible management alternative

Since 1990, a gradual decline in clear cutting prescriptions offset by a steady increase in the shelterwood system preferences has been observed. This is in line with natural conditions which favour application of shelterwood system on a roughly 70% of the national forest stand land. Natural conditions in the remaining 30% of Slovak forests favour the implementation of selection (10%) and clear cutting (20%) systems. Ambitions to achieve a higher

rate of shelterwood system utilisation are currently hampered by persistently high occurrence of incidental felling.

Table 3.5 – 1 Survey of silvicultural systems and their variants according to valid forest management plans

Silvicultural system	Variants	Year							
		1990		2000		2004		2005	
		Felling area (%) / percent of forest stands (%)							
Clearcutting	Small-scale	55.5	52.1	26.9	28.0	24.4	25.0	24.3	25.0
	Large-scale	9.2	7.9	2.2	2.4	11.2	7.1	10.1	6.5
	Forest composition change	0.9	1.2	0.7	0.6	0.5	0.5	0.5	0.4
	Conversion	2.3	2.1	0.3	0.4	1.3	1.0	1.0	0.8
	Edge cut	16.6	15.6	—	—	—	—	—	—
	Together	84.5	78.9	30.1	31.4	37.4	33.6	35.9	32.7
Shelterwood	Small-scale	7.1	6.1	49.2	41.3	40.8	36.6	42.8	38.3
	Large-scale	0.8	0.7	8.0	8.1	7.0	6.3	7.6	6.8
	Over storey removal cut	6.2	8.8	10.9	11.9	12.2	13.8	11.2	12.8
	Together	14.1	15.6	68.1	61.3	60.0	56.7	61.6	57.9
Selection and purpose cut	Single tree and group	1.4	5.5	1.8	7.3	2.6	9.7	2.5	9.4

Source: Summary data on the forests in SR

Shelterwood system as a planned programme of silvicultural treatments throughout the life of the stand prevails in commercial forests (62.3%) and special-purpose forests (64.7%). Protection forests, on the other hand, are preferably managed using either the purpose cut or selection system, both of which provide well for specific site conditions of these forests.

Table 3.5 – 2 Silvicultural systems entered in valid FMP by forest categories

Silvicultural system	Category					
	Commercial		Protection		Special-purpose	
	Felling area (%) / percent of forest stands (%)					
Clearcutting	37.5	36.4	21.2	6.9	28.6	25.8
Shelterwood	62.3	62.8	10.9	7.7	64.7	55.4
Selection and special purpose cutting	0.2	0.8	67.9	85.4	6.7	18.8

Source: Summary data on the forests in SR





## 4. FOREST CONDITION FACTORS

### 4.1. Climate

The territory of Slovakia lies at the border of central, south and east regional European climatic types and is typical for great vertical morphological diversity. Variableness of local topography provides for high variance of climatic conditions, which in return significantly determine living conditions of forest ecosystems. Any greater divergence from long-term climatic normals may lead to decline in health status and resilience of forest ecosystems. Similarly, various physical atmospheric phenomena and weather situations may have detrimental impact on forest well-being; the impact is, however, mostly temporary. Statistical data show that over last decade there have been a number of extreme climatic events (droughts, floods, and violent wind storms) that affect agricultural and forest production as well. The year 2005 was regarding these climatic extremes quite favourable though the consequences of the periods of dry and warm weather in the vegetation period of the years 1998–2003 have been continuing.

Comparatively cold and wet spring and summer of 2005 rather discouraged rapid development of bark beetle populations and increased resistance of forest tree species against fungal infections. Despite that decline of forests, especially spruce woods and Austrian black pine forests, continued. In addition to the aforementioned, gypsy moth outbreaks occurred as well.

### 4.2. Ground level air pollution and soil contamination

Concentrations of the majority of air pollutants (mainly  $\text{SO}_2$  and heavy metals) have significantly decreased when compared to the end of 1980s. Direct impact of air pollution on the condition of Slovak forests is thus generally rather insignificant that is with the exception of high troposphere ozone concentrations in higher altitude mountain locations.

Nevertheless, indirect impact of air pollution on forest ecosystems and soil environment further persists, although on a more limited scale than in the past. Continuing acidification of forest soils is attributed to acid depositions of sulphur and nitrogen. It is generally known that values exceeding their critical loads have detrimental effect on soils and plant life alike. The assessment of critical loads excess, for which data for the last 50 years were used, has indicated that approximately 1/3 of Slovak forests have suffered from acid deposition.

In the past, sulphur deposition typically surpassed volumes of dumped nitrogen ( $\text{NO}_3^-$ ,  $\text{NH}_4^+$ ); long-term trends, however, suggest significant reduction in the volume of sulphur



Figure 12: Mountain regions are most affected by higher loads of acid deposition from the past

deposited on the Slovak territory. Similarly, total acidity of precipitation has significantly decreased. Most recent data clearly point towards ever-increasing role of nitrogen deposition in acidification processes. Towards future, it is assumed it could become a key factor in the prosperity of Slovak forests.

Lesoprojekt Zvolen and FRI Zvolen within the Partial Monitoring System on Forests and ICP International Forests Programme monitored main indicators of sustainable production capacity of forest soils and other soil parameters. Monitoring activities previously mentioned involve the criteria and indicators of sustainable forest management as defined by MCPFE, namely soil reaction (pH), cations exchange capacity (CEC), base saturation (BS), carbon/nitrogen ratio (C/N), as well as other parameters associated with soil contamination and its sensitivity to ground level air pollution. Due to a long-term character of soil forming processes and a comparatively large interval of recurrent assessments, the data are not updated on an annual basis. The next period of soil monitoring in a 16×16 km grid is planned for the years 2006–2007.

Current condition of forest soils in Slovakia is a direct result of ground level air pollution accumulated over several decades. Soil acidification processes are most apparent in higher elevations and regions with larger local sources of acid emissions. Results of active soil reaction assessment show that around 25% of forest soils currently display very acid reaction (pH < 4.5); 40% of soils records acid (pH 4.5–5.5), 17% moderately acid (pH 5.5–6.5), 5% neutral (pH 6.5–7.2), and 13% moderately alkaline (pH 7.2–8.0) reaction. Measurements taken over last decade do not confirm progressing acidification of forest soils in Slovakia (if referred to pH values); in some regions, however, soils with lower buffering capacity might still be suffering from excess acidification. The problem persists with local and regional contamination of soils with heavy metals; the contamination is most noticeable in areas around major industrial facilities.

### 4.3. Overview of harmful agents

Volume of incidental felling is used in Slovak forest planning practice as an indicator best describing detrimental impact of harmful agents on forest health. The indicator figure for 2005, entered into statistical record No. L–144, equalled 6.533 million m<sup>3</sup> (64% of the total 2005 felling) – the largest volume in history of Slovak modern forestry.

Table 4.3 – 1 Incidental felling percent

Year / Percent of incidental felling out of total annual felling (%)										
1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
56.1	58.9	57.1	41.7	45.5	48.6	39.5	34.5	41.3	40.1	64.0

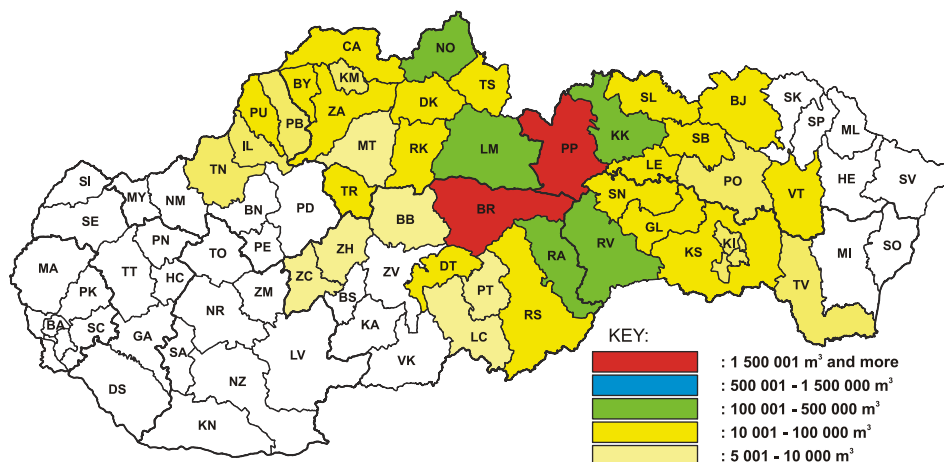
Source: Summary data on the forests in SR

#### 4.3.1. Abiotic agents

In 2005, wind damage to Slovak forests was smaller than in 2004; only local small-scale windthrow were recorded. Nevertheless, forestry practice continued with processing of wood from wind disaster of 19 November 2004. For the period 1996–2005, the total volume of windthrow processed timber represented 17 438 thousand m<sup>3</sup> with almost 30%



of the volume (5 177 ths m<sup>3</sup>) processed in the year 2005 itself. Wind-induced incidental felling hence topped 2005 statistics for incidental felling caused by abiotic agents. Due to various weather extremes (wind storms, heavy snowfall, rime, and drought) and un-



Source: FRI Zvolen (Record L 116)

Figure 13 Windthrow volume percent by district

known abiotic agents 5 311 thousand m<sup>3</sup> of timber were processed in 2005 in total with windthrow contributing to almost 98% of the volume. In terms of spatial distribution, windthrow pattern has remained unchanged. Major windthrow incidents occurred in traditional “hotspots” to which primarily belong the northern part of Žilina and Banská Bystrica region and western part of Prešov and Košice region. The largest volume of windthrow salvage was reported from Poprad (2 200 ths m<sup>3</sup>) and Brezno (1 215 ths m<sup>3</sup>) districts. If split by particular tree species, the figures are as follows: spruce (4 551 ths m<sup>3</sup>), beech (205 ths m<sup>3</sup>), fir (176 ths m<sup>3</sup>), and pine (127 ths m<sup>3</sup>).

Extent of forest damage by snow was slightly below the average when compared to decennial trends. More than 45 thousand m<sup>3</sup> of snow-damaged timber were reported, out of which 33 thousand m<sup>3</sup> have been processed in the region of Žilina (21 ths m<sup>3</sup> or 64%) to date, mainly in the district of Dolný Kubín (12 ths m<sup>3</sup>). If split by particular tree species, the figures are as follows: spruce (23 ths m<sup>3</sup>), beech (4 ths m<sup>3</sup>), and pine (3 ths m<sup>3</sup>). Of other agents, damage caused by rime was negligible – only 4 thousand m<sup>3</sup> of damaged timber, almost entirely immediately processed. Rime caused most damage in the forests of Levice district (1 ths m<sup>3</sup>) with beech being hit most (2 ths m<sup>3</sup>).



Figure 14 Spruce forest damaged by top wind breakage



On the other hand, much greater extent of forest ecosystems damage can be attributed to drought. Records show that 89 thousand m<sup>3</sup> of snags together with 83 thousand m<sup>3</sup> of incidental felling were brought down to drought-induced forest decline. As the identification of drought damage is rather disputable the abovementioned figures should be seen as a qualified estimate only. The areas with the highest percent of drought-damaged forests include Bratislava (27 thousand m<sup>3</sup> of salvage timber) and Trnava (24 thousand m<sup>3</sup>) regions. From the long-term perspective, drought is seen as a serious decline factor in the pinewoods of Záhorie region. Volume of drought-induced incidental felling in the pinewoods amounted to 34 thousand m<sup>3</sup> last year. Other tree species also suffered significantly – notably spruce and oak with 12 thousand m<sup>3</sup> of processed timber each and beech with 10 thousand m<sup>3</sup>. Unknown agents damaged 14 thousand m<sup>3</sup> of timber nearly all of which already processed.

Table 4.3.1 – 1 Incidental felling (m<sup>3</sup>) caused by mechanically destructive abiotic agents 1996–2005

Year	Wind	Snow	Rime	Together
1996	1 122 026	125 590	117 843	1 365 459
1997	1 815 592	51 245	64 857	1 931 694
1998	954 270	30 538	29 161	1 013 969
1999	1 472 253	43 456	6 611	1 522 320
2000	2 143 483	74 807	6 413	2 224 703
2001	933 670	31 242	466 743	1 431 655
2002	1 115 861	42 514	54 306	1 212 681
2003	1 607 474	16 004	20 338	1 643 816
2004	1 096 220	15 786	25 866	1 137 872
2005	5 177 337	33 059	3 931	5 214 327
Together	17 438 186	464 241	796 069	18 698 496

Source: FRI Zvolen (Record L 116)

Table 4.3.1 – 2 Extent of forest damage by abiotic agents (m<sup>3</sup> of timber)

Abiotic agent	Damaged	Processed	Untreated
Wind	5 848 943	5 177 337	671 606
Snow	45 426	33 059	12 367
Rime	3 949	3 931	18
Drought	89 320	82 623	6 697
Unknown causes	14 038	13 856	182
Together	6 001 676	5 310 806	690 870

Source: FRI Zvolen (Record L 116)

## 4.3.2. Biotic agents

### *Insect pests*

In 2005, forest damage caused by insect pests emulated situation from previous years when forests were most vigorously attacked by bark beetle and woodborer species. These species damaged total of 1.011 million m<sup>3</sup> of timber out of which 875 thousand m<sup>3</sup> have

been processed. Highest losses in terms of timber volume were attributed to European spruce bark beetle (*Ips typographus*), which damaged 899 thousand m<sup>3</sup> of timber; 85% or 767 thousand m<sup>3</sup> has already been removed. Year 2005 was the second in line of an exceptionally high bark beetle infestation of spruce woods. The year before, 888 thousand m<sup>3</sup> of timber were killed; out of that volume 764 thousand m<sup>3</sup> were readily removed. The aforementioned rather alarming figures clearly show that bark beetle and woodborer infestation of Slovak forests has become one of the most challenging tasks forest protection has to face. Bark beetle primarily attacked standing weakened and broken trees from the 2004 calamity windthrow. It is believed that this windthrow will in due course contribute to further bark-beetle-induced decline of spruce woods. Increased activity of this beetle is expected on sites with unprocessed timber; the attack is most imminent on forest margins around windthrow openings. Intensity and scale of future attacks will very much depend on the weather development; it is known that warm and dry weather considerably increases the risk of bark beetle outbreaks.



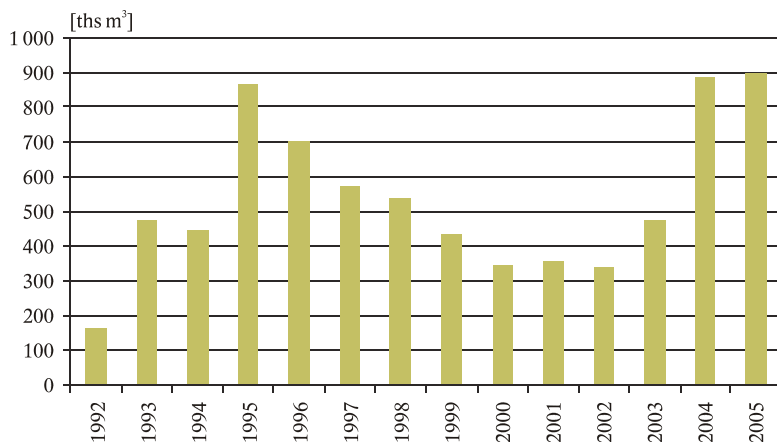
Figure 15 European spruce bark beetle is the commonest insect pest of Slovak forests

Table 4.3.2 – 1 Main bark beetles, woodborers, defoliators and sucking insects and complementary control management measures

Bark beetles and Woodborers	Infested	Removed (m <sup>3</sup> )	To be removed	Defoliators and sucking insects	Infestation scale (ha)		
					Mild	Serious	Total
European spruce bark beetle	898 846	767 387	131 459	Gypsy moth	4 633	8 865	13 498
Pine bark beetle	93 729	88 822	4 907	<i>Boarmia</i> and shoot moth sp.	1 631	403	2 034
Conifer ambrosia beetle	2 691	2 676	15	Cockchafer (imago and grub)	477	3	480
Pine shoot beetle and other similar species	8 442	8 417	25	Aphids	160	20	180
European oak bark beetle	3 987	3 987	—	<i>Cephalcia abietis</i> (L.)	187	0	187
Northern bark beetle	—	—	—	Pine sawfly	42	0	42
Other species	3 281	3 277	4	Other species	10	0	10
Together	1 010 976	874 566	136 410	Together	7 140	9 291	16 431

Source: FRI Zvolen (Record L 116)

In 2005, the outbreak of gypsy moth reached its peak. The general assumption is that year 2006 will witness a decline in the population numbers of this pest. Conclusions drawn for other leaf eating and sucking insect pests are on a more positive note with the area of forest damaged by the aforementioned species steadily declining when compared to 2004. The only exception was a small increase in spruce damage by *Cephalcia abietis* (L.) and pine damage by pine sawfly *Diprion pini* (L.).



Source: FRI Zvolen (Record L 116)

Figure 16 Trends in European spruce bark beetle infestation

### Phytopathogenic microorganisms

In 2005, 274 thousand m<sup>3</sup> of timber were entered into forest accounts as disease and pathogen damaged. Out of this volume, lower than in 2004, 248 thousand m<sup>3</sup> were processed. Most common forest pathogens included honey mushroom *Armillaria ostoyae* and Annosum root rot *Heterobasidion annosum*. These fungi pose a serious threat to vitality of Slovak forests and are most widespread in spruce woods of Kysuce, Orava, the High Tatra Mts. foothills, Spišská Magura Mts., Levočské vrchy Hills and Slovenské rudohorie Mts.

Fungus-borne vascular diseases infected mostly oak stands. Other diseases with fungus as causal agent included black pine's infection by *Schaeropsis sapinea* and Scots pine suffering from *Lophodermium* needle cast symptoms.

Table 4.3.2 – 2 Volume of timber infected by main groups of forest diseases and pathogens (m<sup>3</sup>)

Pathogen	Infected (m <sup>3</sup> )	Processed (m <sup>3</sup> )	To be processed (m <sup>3</sup> )
Rots	17 282	15 604	1 678
Fungus-borne vascular diseases	15 521	15 109	412
Needle casts	4 386	4 084	302
Canker	97	97	0
Honey mushroom	235 780	212 001	23 779
Unknown	1 061	1 031	30
Together	274 127	247 926	26 201

Source: FRI Zvolen (Record L 116)

### Forest game

Exceptionally harsh weather conditions in the second half of 2004-2005 winter season with a long period of snow cover coupled by a resumed increase in deer population numbers resulted in considerable damage estimated at 12.309 million SKK of lost revenue. Forests most affected by game were located in the regions of Prešov – 3.115 million SKK and Trnava – 2.040 million SKK. Geographic distribution of game damage is rather heterogeneous. The highest loss of revenue – 1 891 thousand SKK, was recorded in plantations of cloned poplars in the district of Dunajská Streda, forest enterprise Gabčíkovo. Deer po-

pulation migrating from Hungary in winter months of January and February usually cause damage to plantations. Other forest areas severely affected by game included Levočské vrchy Hills (Kežmarok district with a revenue loss estimated at 1 406 thousand SKK) and the region of Horná Nitra (Prievidza district with the revenue loss of 1 080 thousand SKK).



Figure 17 Deer populations cause most forest damage on sites of their increased concentration in wintertime

Table 4.3.2 – 3 Revenue losses attributed to game in the State Forests of SR 2004–2005

Region	Young stands					Mature stands		Loss in total (SKK)
	Area (ha)		Loss (SKK)		Together (SKK)	Area (ha)	Loss (SKK)	
	Damaged	Destroyed	Damaged	Destroyed				
Bratislava	120.42	0.32	305 136	3 615	308 751	6.00	47 758	356 509
Trnava	106.62	37.60	133 216	1 906 651	2 039 867	—	—	2 039 867
Trenčín	156.20	6.34	418 875	284 508	703 383	60.28	821 284	1 524 667
Nitra	60.37	19.87	76 270	714 166	790 436	0.07	1 878	792 314
Žilina	51.39	4.16	207 712	445 731	653 443	103.73	1 308 597	1 962 040
Ban. Bystrica	92.80	9.92	293 583	649 961	943 544	31.20	1 045 699	1 989 243
Prešov	125.74	30.89	601 482	2 265 096	2 866 578	14.78	248 426	3 115 004
Košice	50.68	6.14	150 944	288 376	439 320	1.68	89 907	529 227
Together SR	764.22	115.24	2 187 218	6 558 104	8 745 322	217.74	3 563 549	12 308 871

Source: FRI Zvolen (Record L 116)

### 4.3.3 Anthropogenic agents

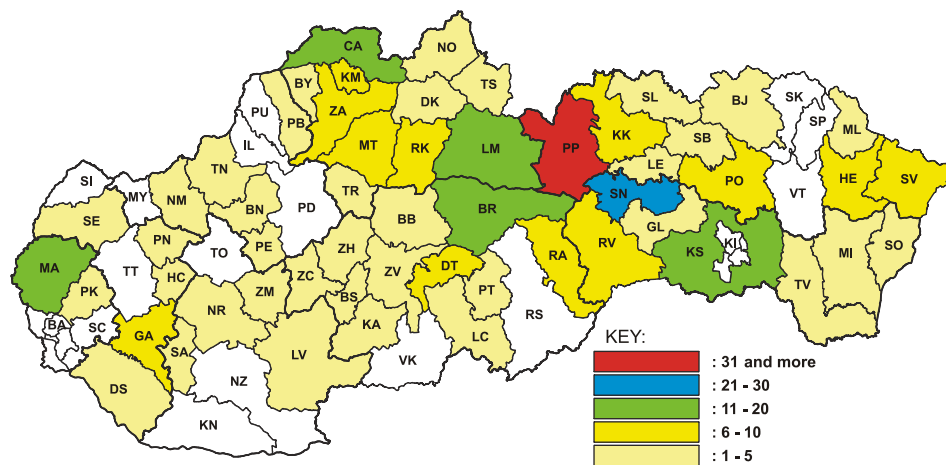
#### *Ground level air pollution*

Ground level pollution is seen as one of the most significant anthropogenic factor to blame for compromised health of Slovak forests. Pollution-weakened forests are more susceptible to damage by abiotic and biotic agents. As previously mentioned, the level of acid deposition is despite its recent decrease still comparatively high. Despite the introduction of more environmentally friendly technologies, reduced transboundary emissions and a slump in local industrial production it will take decades for forest ecosystems to recover. The impact of pollution is most apparent in the regions of Orava and Kysuce where a so-called asymptomatic yellowing of spruce has directly been linked to worsening air quality; increased levels of sulphur oxides and heavy metals have been named as one of the main contribution factors. Among other forests hard hit by pollution are those in Gelnica, Kežmarok, and Spišská Nová Ves districts.



### Other anthropogenic agents

Among other anthropogenic causes of forest decline, forest fires are the most prominent. 2005 statistics record 286 forest fires with the total area of 503 ha. The largest number of forest fires – 63 was reported from the Prešov region. Out of the total number, 91 fires were a direct result of grass burning practices; 77 fires were attributed to illegal campfires; and 35 fires are believed to be caused by open fire mishandling.



Source: Fire-technical and expertise institute of Ministry of Interior, Bratislava

Figure 18 Forest fires in 2005

The most destructive fire broke out on June 29 2005 in the cadastre area of Závadka nad Hronom in the district of Brezno destroying 52.44 ha of windthrow (estimated loss of 27 million SKK) belonging to the Forests of the Slovak Republic Banská Bystrica. The most extensive fire broke out on the eastern edge of Tatranská Polianka village in the cadastre area of Vysoké Tatry (Poprad district) on July 30 2005. The fire destroyed 229 ha of windthrow damaged forest and 27 ha of standing forest; the origin of the fire remains largely unknown, most probable explanation is that it was caused by open fire mishandling. The loss was estimated at 17 million SKK. The cost could have been much higher should not the majority of windthrow have already been processed.

Volume of timber illegally stolen amounted to 11 029 m<sup>3</sup>. It is assumed a substantial volume of timber removed from forests by poorer residents for heating and cooking went grossly unreported. The theft problem was most apparent in the districts of Čadca (1 484 m<sup>3</sup>), Rimavská Sobota (1 150 m<sup>3</sup>), Rožňava (705 m<sup>3</sup>), and Vranov nad Topľou (748 m<sup>3</sup>).

## 4.4. November 2004 windthrow salvage

### State Forests of TANAP

Processing of timber from wind calamity: In 2005 the plan put the volume of timber processing at 70% of the total windthrow, more precisely 1.421 million m<sup>3</sup> out of the total 2.03 million m<sup>3</sup> of timber pending processing. In reality, the planned volume was excee-

ded by 17% (1.667 million m<sup>3</sup>). When added to the 2004 volume, 85.8% of calamity wood has been processed so far.



*Figure 19 TANAP State Forests salvaged 86% of windthrow by the end of 2005*

**Forest restoration:** Forest restoration in windthrow areas was guided by a desire to establish species-rich patch-like forests with uneven age structure to enhance their future resilience and vitality. Forest restoration as intended is spread over a period of 15–20 years; it is based on a number of restoration projects taking into account actual forest condition in windthrow areas.

In 2005, restoration works of windthrow area covered 650 ha. Based on the restoration project, 198 ha of forest were restored to create a patchwork-like mosaic of forest comprising bio groups and stabilisation belts.

**Forest protection:** The FRI–FPS Zvolen in line with the forest protection project drafted Forest protection measures applied in the windthrow area; the measures aimed at prevention rather than remediation of damaged stands. As for 2005 forest monitoring, main efforts focused on the bark beetle populations in order to prevent projected infestation of windthrow-damaged forests and their adjacent areas. A combination of pheromone traps and trap trees was used to maximize the effectiveness of implemented measures. Forest protection costs rose to 3 044 thousand SKK last year.

In total, there were 3 500 pheromone traps installed to combat bark beetle; 3 110 of them were set for European spruce bark beetle; 131 for conifer ambrosia beetle; and 259 for pine bark beetle. The largest increase in the number of trapped imago was recorded for the last species numbers of which increased tenfold in the course of its summer swarming season.

#### *Non-state forests*

**Processing of timber from wind calamity:** Within the area of non-state forest forests, 1 071 thousand m<sup>3</sup> out of 1 276 thousand m<sup>3</sup> of windthrow timber (83.9%) were proces-

sed. The work progress was hampered by the diversity of local topography and poor accessibility of affected areas.

Forest restoration: 426 ha of windthrow area were reforested; new forest was planted on 393 ha; remaining 33 ha regenerated naturally.

Forest protection: Costs related to forest protection against biotic agents in non-state forests were estimated at 5 032 thousand SKK.

*Forests of the Slovak Republic, state enterprise*

Processing of timber from wind calamity: Of the total volume of 1 994 thousand m<sup>3</sup>, 1 859 thousand m<sup>3</sup> (93.2%) were readily processed.

Forest restoration: Forest restoration operations covered 575 ha of forest. The restoration method was based on the establishment of mosaic forest vegetation cover with an increased diversity of tree species.



*Figure 20 2004 windthrow was severely felt also in the Nízke Tatry Mts. forests*

Forest protection: In the areas affected by windthrow, 17 141 pheromone traps were installed. On close inspection they revealed an estimated 221 million specimens of European spruce bark beetle, 293 million specimens of conifer ambrosia beetle and 587 thousand specimens of pine bark beetle. Ground chemical treatment covered 179 thousand m<sup>3</sup> of scattered windthrow; 404 ha of compact windthrow were chemically treated using aircraft spraying. Protection costs against biotic agents rose to 16 070 thousand SKK.







## 5. MAIN FACTORS OF FOREST PRODUCTION

### 5.1. Natural conditions

One of the main characteristics of Slovak forests is the diversity of their natural conditions. This diversity is reflected in the national classification system of forest sites in which sites are grouped into several categories based on the 8 basic vegetation zones. Particular vegetation zones differ greatly in a number of basic climatic variables such as altitude, length of vegetation period, mean annual temperature and annual precipitation. On a horizontal scale, the system is based on variables describing local soil conditions, water regime and topography. Great variability of natural and growth conditions is responsible for the introduction of special units called forest site types. These units are further grouped into higher hierarchical units called management units of forest site types (MUFST). It is assumed that forest stands belonging to a particular MUFST respond similarly to silvicultural, harvesting and protection measures. In practical terms, these units are used to set realistic management objectives.



Figure 21 Beech zone forests are highly stable and provide good quality timber

Table 5.1 – 1 Forest vegetation zones

Vegetation zone / area (ha / %)								Total
Oak	Oak-beech	Beech-oak	Beech	Beech-fir	Fir-beech-spruce	Spruce	Dwarf pine	
140 373	265 332	457 063	401 346	419 371	186 434	41 141	20 585	1 931 645
7.27	13.74	23.66	20.78	21.71	9.65	2.13	1.06	100

Source: Summary data on the forests in SR, 2006

Table 5.1 – 2 The most common forest site type management units (> 20 thousand ha)

MUFST	Unit	Area (ha)	MUFST	Unit	Area (ha)
108	Oak – hornbeam woods on loess	24 124	402	Calcareous beech woods	31 818
111	Fertile oak – hornbeam woods	20 133	410	Fertile beech woods (drier type)	97 550
112	Oak – pine woods on most productive acid soils	26 330	411	Fertile beech woods	153 173
208	Oak – beech woods on loess	87 592	413	Moist beech woods	22 307
209	Dry oak – beech woods	41 035	416	Beech woods with <i>Tilia spp.</i> on rocky soils	23 739
211	Oak – beech woods	76 198	502	Calcareous beech – fir woods	26 471
302	Calcareous beech – oak woods	22 099	505	Acid beech – fir woods	52 222
305	Acid beech – oak woods	35 398	511	Fertile beech – fir woods	249 668

Table 5.1 – 2 – contd.

MUFST	Unit	Area (ha)	MUFST	Unit	Area (ha)
310	Fertile beech – oak woods (drier type)	125 912	592	Calcareous beech – fir woods (protection type)	20 932
311	Fertile beech – oak woods	170 828	605	Acid spruce – (beech) – fir woods	31 396
313	Moist beech – oak woods	36 613	611	Fertile spruce – beech – fir woods	63 016
316	Beech – oak woods with <i>Tilia spp.</i> on rocky soils	21 580	—	Other	471 511

Source: Summary data on the forests in SR, 2006

Explanatory note: MUFST – Management unit of forest site type

## 5.2. Forest area

Forest land with forest stands including clearings intended for reforestation form stand land. On top of that, forest land as a term also includes forest- stripped areas turned into forest nurseries, seed orchards, forest roads, yards, depots, divisional strips, plots with special use, etc., that is to say “forest infrastructure” facilitating forest management and production.

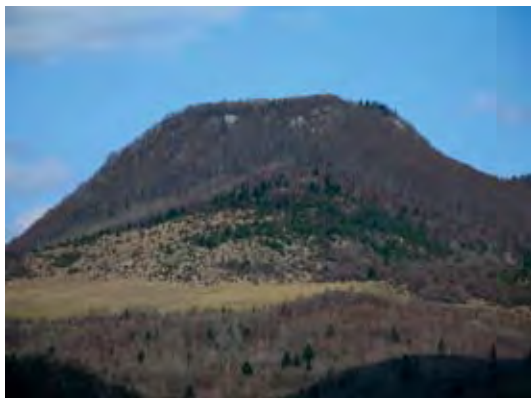
Table 5.2 – 1 Forest land and stand land

Type	Area (year / ha)					
	1970	1980	1990	2000	2004	2005
Forest land	1 918 571	1 952 656	1 976 538	1 997 961	2 005 598	2 006 172
Stand land	1 826 564	1 861 642	1 921 705	1 921 414	1 930 692	1 931 645

Source: Summary data on the forests in SR, 2006

Except for the abovementioned forest, additional 38 727 ha of land, cadastre registered as farmland, are presently covered by forest vegetation. Such plots are termed “white plots” and are excluded from regular forest surveys and monitoring.

Figure 22 Forest area is increasing also as a result of natural colonisation of abandoned farmland



Forest land and stand land are for tenure and management reasons further divided into the units of special spatial arrangement of the forest represented by forest tenure units (FTU) and their subunits-compartments. Compartments might consist of up to several sub-compartments (plots significantly differing in age or tree species composition) and temporary stand groups found in regenerating forest stands.

Table 5.2 – 2 Development of average size of the units of spatial arrangement of forest (ha)

Year	FTU	Compartment	Sub-compartment	Stand group
2002	988	7.40	5.20	3.13
2003	883	7.32	5.12	3.08
2004	829	7.25	5.06	3.04
2005	881	7.19	4.98	3.00

Source: Summary data on the forests in SR

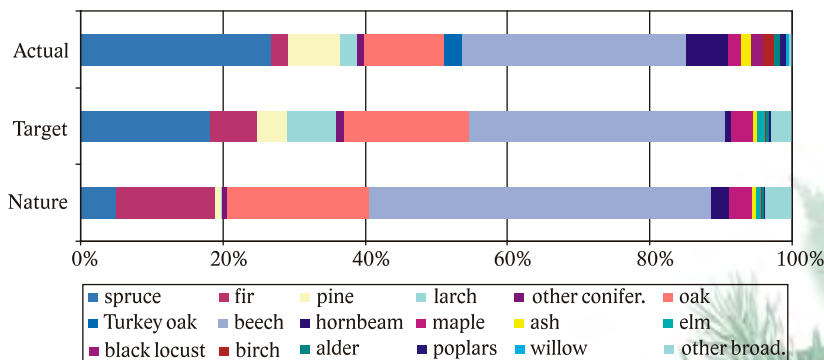
### 5.3. Tree species composition and origin of forest

Contemporary species composition of Slovak forests results from natural site conditions and societal needs for particular forest benefits, services and products. From the long-term management perspective, one of the most important challenges Slovak foresters are facing at present is to improve diversity of forest stands to strengthen their resilience and vitality.

Table 5.3 – 1 Tree species in Slovak forests

Tree species – %										
SM	JD	BO	SC	KS	Σ I	DB	CR	BK	HB	
26.3	4.1	7.2	2.3	1.1	41.0	10.9	2.5	31.0	5.7	
JV	JS	AG	BR	JL	LP	TD	TS	OL	Σ L	
1.9	1.4	1.7	1.4	0.8	0.4	0.4	0.5	0.4	59.0	

Legend: SM – spruce; JD – fir; BO – pine; SC – larch; KS – dwarf pine; Σ I – total coniferous; DB – oak; CR – Turkey oak; BK – beech; HB – hornbeam; JV – maple; JS – ash; AG – black locust; BR – birch; JL – alder; LP – lime tree; TD – domestic poplars; TS – hybrid poplars; OL – other broadleaved; Σ L – total broadleaved



Source: Natural and target tree species composition: FRI Zvolen, 1998

Actual tree species composition: Summary data on the forests in SR, 2006

Figure 23 Comparison between actual, natural and target tree species composition

Forest tree diversity is one of the most important prerequisite of their resilience and stability. Tables 5.3 – 2 a 5.3 – 3 show the level of forests diversity in Slovakia.

Table 5.3 – 2 Area of coniferous, broadleaved and mixed forests (ha / %)

Forests with coniferous percent		Forests with broadleaved percent		Mixed forests	Clearing	Total
+91%	75–90%	+91%	75–90%			
478 621	121 357	816 466	141 035	362 500	11 666	1 931 645
24.8	6.3	42.3	7.3	18.7	0.6	

Source: Summary data on the forests in SR, 2006

Table 5.3 – 3 Area of forests by number of tree species

Number of tree species / area (ha, %)								
1	2	3	4	5	6	7	> 8	Clearing
344 030	447 030	492 233	337 889	176 152	77 399	30 240	15 006	11 666
17.8	23.1	25.5	17.5	9.1	4.0	1.6	0.8	0.6

Source: Summary data on the forests in SR, 2006

In Slovak forest management practice, high forest represents a basic type of forest origin. The total area of coppice does not exceed 2% of the total stand land and has been continually decreasing (6.2% down since 1980). Average coppice growing stock per ha amounts to approximately 112 m<sup>3</sup>; in high forests for timber production the respective volume is 232 m<sup>3</sup>. Conversion of coppice to high forest is a common practice in cases when site conditions ensure significant enhancement of forest products and services in the future.

Table 5.3 – 4 Coppice area

Indicator	Year				
	1980	1990	2000	2004	2005
Coppice area (ha)	151 217	79 324	42 157	37 794	36 333
Area percent from stand land (%)	8.12	4.13	2.19	1.96	1.88

Source: Summary data on the forests in SR

A number of naturalised exotic tree species are also to be commonly found in Slovak forests. Some of these species such as Douglas fir, grand fir and northern red oak have adapted so well that they thrive in their new homeland. In recent years, the area of forests formed by exotic species has remained stable except for the continuing expansion of black locust, competitive edge of which is well noticeable also on non-forest land.



Figure 24 Black locust is the most common domesticated introduced tree species in Slovakia



Table 5.3 – 5 Exotic tree species on forest land

Species	%
Black locust	1.72
<i>Populus × euroamericana</i> (I 214 + Robusta)	0.52
Black pine	0.52
Other conifer: Douglas fir; grad fir; eastern white pine	0.08
Other broadleaved: northern red oak; sweet chestnut; horse chestnut; ash-leaf maple	0.15

Source: Summary data on the forests in SR, 2006

## 5.4. Age class structure

An age structure of the majority of central Europe forests is a direct result of past management practices. As one of the most important forest management attributes it fundamentally mirrors methods and scale of stand regeneration and effectiveness of silvicultural treatment applied. Even distribution of age classes is imperative for sustainable timber production and delivery of other forest-related benefits and services.



Figure 25 Actual area of 50–90 year old forests in Slovakia exceeds their normal area representation

In forestry practice, the assessment of actual forest age structure is usually based on a so-called optimal area of age classes. At present, the age structure of Slovak forests partially deviates from the one seen as optimal (Figure 26). The deviation is most apparent in the group of middle (6 – 9) and oldest (15+) age classes, which are over represented. Disproportionately high presence of forests in the oldest (15+) classes is chiefly attributed to a high per cent of over mature protection forests. For all age classes, broadleaved species prevail over conifer species (Figure 26).

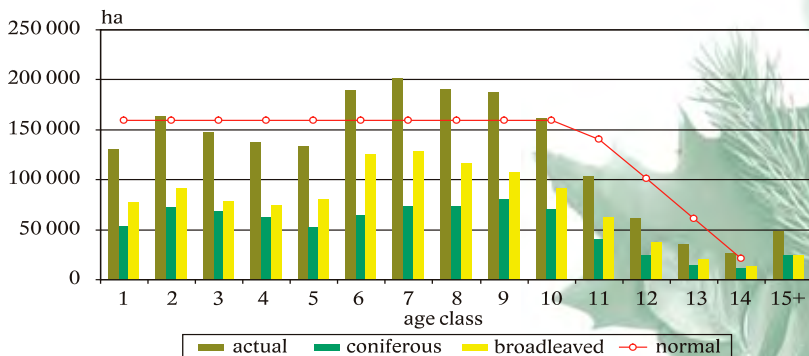


Figure 26 Age class structure (actual and normal)

Table 5.4 – 1 Age class structure (actual and normal) of Slovak forests

Age class structure	Age class (ha / %)							
	1	2	3	4	5	6	7	8
Actual	130 702	163 965	147 367	137 474	133 288	189 500	201 971	190 934
	6.81	8.54	7.68	7.16	6.94	9.87	10.52	9.94
Coniferous	53 053	72 587	68 559	62 509	52 048	64 484	72 901	74 449
Broadleaved	77 650	91 378	78 807	74 964	81 240	125 016	129 070	116 486
Normal	159 732	159 732	159 732	159 732	159 732	159 732	159 732	159 732
	8.32	8.32	8.32	8.32	8.32	8.32	8.32	8.32
—	9	10	11	12	13	14	15+	Clearing
Actual	187 511	161 897	103 684	61 708	35 841	25 727	48 410	11 666
	9.77	8.43	5.40	3.21	1.87	1.34	2.52	100
Coniferous	79 858	70 712	40 669	24 208	14 750	11 730	23 993	786 510
Broadleaved	107 653	91 184	63 016	37 500	21 091	13 997	24 417	1 133 470
Normal	159 732	159 732	140 564	100 631	60 700	20 785	—	1 919 980
	8.32	8.32	7.32	5.24	3.16	1.08	—	100

Source: Summary data on the forests in SR, 2006

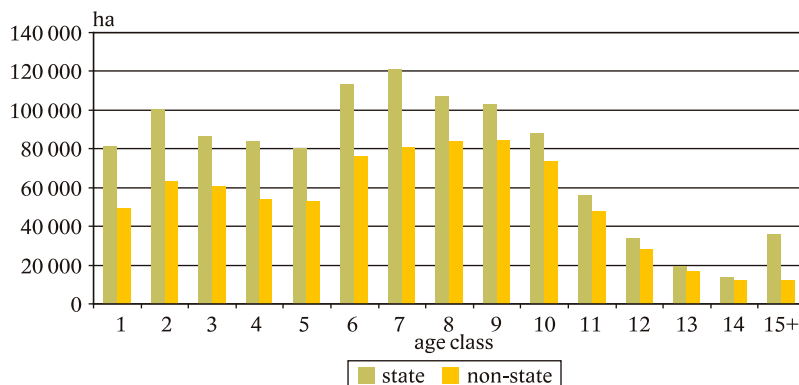


Figure 27 Actual age class structure by tenure (state and non-state)

At present, the average rotation age of Slovak forests is 122 years; 108 years for commercial forests; 116 years for special-purpose forests; and 193 years for protection forests. The average length of regeneration period is given as 41 years, 30 years for commercial forests and 35 years for special-purpose forests. In protection forests, where the main management objective is to attain natural forest structure, the regeneration period is presumed permanent.

### 5.5. Spatial forest structure

In primeval and natural forests, where the spatial and age structure is very diverse, a continual replacement of over mature, diseased or natural disturbance damaged trees is an integral part of natural forest dynamics. However, this is not the case for the majority of European forests established by mankind in which age diverseness is aided by regeneration felling.

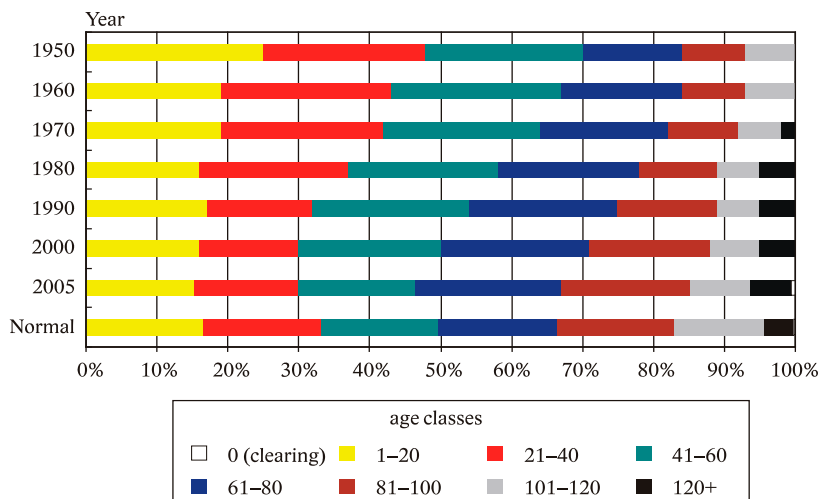


Figure 28 Trend of age composition of forests according to age classes

Based on the degree of naturalness, the forests are divided into several categories: primeval forests undisturbed by man, natural forests, semi-natural forests and plantations, both of production and protection type. Naturalness of a particular stand is assessed on the basis of its composition and spatial structure. Majority of Slovak forests belong to the category of natural forests (946 thousand ha, 49%) and semi-natural forests (940 thousand ha, 48.8%). A small percentage of forests also fall within the category of primeval forests (24 thousand ha, 1.2%); the remaining 1% are plantations (19 thousand ha).



Figure 29 Systematic management is needed to improve vertical structure of forest plantations

As for the age and vertical structure, prevalence of Slovak forests belongs to single-storey, age and height little differentiated forests (79%). On the contrary, three- and multi-storey forests cover only 2% of the country's forest estate.

Table 5.5 – 1 Current area proportion of single, double and multi-storey forest stands by forest categories

Category	Stand land area (ha)	Single-storey stands		Two-storey stands		Three- and multi-storey stands	
		(ha)	(%)	(ha)	(%)	(ha)	(%)
Commercial	1 307 723	1 052 196	80.5	233 111	17.8	22 416	1.7
Protection	327 843	244 798	74.7	75 459	23.0	7 586	2.3
Special-purpose	296 079	228 753	77.3	58 453	19.7	8 873	3.0
Total	1 931 645	1 525 747	79.0	367 023	19.0	38 875	2.0

Source: Summary data on the forests in SR, 2006

## 5.6. Growing stock and increment

Latest statistics show a steady increase in the volume of growing stock found in Slovak forests. The exact figure for 2005 was 438.9 million m<sup>3</sup> of timber with a top diameter greater than 7 cm under bark (u.b.). The average “ha” stock was estimated at 229 m<sup>3</sup> of the abovementioned size timber.

Table 5.6 – 1 Growing stock

Indicator	1970	1980	1990	2000	2004	2005
	(Million m <sup>3</sup> u.b.)				(m <sup>3</sup> u.b.)	
Growing stock total	313.3	324.0	348.5	410.0	434 399 585	438 905 076
Coniferous	169.0	170.0	178.9	199.1	205 623 357	207 354 221
Broadleaved	144.3	154.0	169.6	210.9	228 776 228	231 550 855
Growing stock per ha (m <sup>3</sup> )	171	174	181	215	226	229
Growing stock in forests available for wood supply					398 638 577	403 439 263
Coniferous					186 088 080	187 925 355
Broadleaved					212 550 497	215 513 908

Source: Summary data on the forests in SR

Table 5.6 – 2 Growing stock by age class

Indicator	Age class							
	1	2	3	4	5	6	7	8
Growing stock (thousand m <sup>3</sup> / %)	92	2 348	12 423	20 291	26 197	45 072	55 324	58 863
	0.02	0.53	2.83	4.62	5.97	10.27	12.61	13.41
Growing stock per ha (m <sup>3</sup> )	1	14	84	148	197	238	274	308
	9	10	11	12	13	14	15+	Total
Growing stock (thousand m <sup>3</sup> / %)	63 688	58 895	38 659	21 951	12 396	7 922	14 784	438 905
	14.51	13.42	8.81	5.01	2.82	1.80	3.37	100
Growing stock per ha (m <sup>3</sup> )	340	364	373	356	346	308	305	229

Source: Summary data on the forests in SR, 2006

When compared to 1970, the total volume of growing stock increased by 40.8%; at the same time, the average “ha” volume increased by 33.9%. The aforementioned increase has largely been attributed to both the uneven age structure of Slovak forests with a disproportionately high presence of 50 to 90-year old forest stands (Chapter 5.4) and more accurate methods of growing stock estimate (improved yield tables).

As the present practice of growing stock calculation is based on yield tables. The following tables provide the development of basic input data (age, height yield class, stocking) for its determination. The analysis clearly shows a gradual annual increase of growing stock with progressing age and height yield class for each of the selected tree species. The stand density is largely even with only a slight decline towards the 5th age class. From the 6th class onwards, a steady increase of the stocking is observed. Observations show that the aforementioned parameters are the ones largely responsible for the ever-increasing growing stock of Slovak forests



Table 5.6 – 3 Average tree age by species

Year	Average age (years)								
	Spruce	Fir	Pine	Larch	Oak	Beech	Hornbeam	Maple	Ash
2005	67.6	76.8	63.8	47.7	75.4	71.0	64.1	51.8	52.6
2004	67.1	76.8	63.4	47.2	74.9	70.8	63.8	51.8	52.4
2003	66.6	76.3	62.7	46.3	74.4	70.6	63.7	51.7	52.4
2002	66.4	76.0	61.7	45.7	73.3	70.3	63.3	51.6	52.0
2001	66.1	76.0	60.8	45.1	72.4	69.8	62.5	51.3	51.4
2000	66.2	76.1	60.8	44.9	72.1	70.1	62.5	51.7	51.8

Source: Summary data on the forests in SR

Table 5.6 – 4 Average absolute height yield by species

Year	Average absolute height yield (m)								
	Spruce	Fir	Pine	Larch	Oak	Beech	Hornbeam	Maple	Ash
2005	29.4	28.3	25.5	26.4	23.6	25.8	23.1	25.9	28.7
2004	29.2	28.2	25.3	26.1	23.5	25.6	22.9	25.7	28.4
2003	29.1	28.0	25.4	26.3	23.4	25.5	22.8	25.4	28.3
2002	29.0	27.9	25.2	26.2	23.4	25.3	22.2	25.2	28.2
2001	28.8	27.7	25.1	26.0	23.3	25.1	22.1	25.0	28.1
2000	28.6	27.4	25.0	25.7	23.1	25.0	22.0	24.8	28.0
1999	28.3	27.1	24.8	25.3	23.1	24.7	21.8	24.4	27.8

Source: Summary data on the forests in SR

Table 5.6 – 5 Stand density by age class

Year	Stand density															Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+	
2005	0.88	0.89	0.86	0.83	0.81	0.79	0.78	0.77	0.76	0.77	0.77	0.76	0.73	0.71	0.70	0.81
2004	0.89	0.89	0.86	0.83	0.81	0.79	0.78	0.77	0.76	0.77	0.77	0.76	0.73	0.71	0.70	0.81
2003	0.89	0.89	0.87	0.83	0.81	0.79	0.77	0.76	0.76	0.76	0.76	0.75	0.72	0.70	0.70	0.80
2002	0.88	0.89	0.87	0.83	0.81	0.79	0.77	0.76	0.76	0.76	0.76	0.75	0.72	0.70	0.70	0.80
2001	0.88	0.89	0.87	0.83	0.81	0.79	0.77	0.76	0.76	0.76	0.75	0.74	0.72	0.70	0.69	0.80
2000	0.88	0.90	0.87	0.83	0.81	0.78	0.77	0.76	0.75	0.76	0.75	0.74	0.71	0.70	0.69	0.80
1999	0.88	0.90	0.86	0.83	0.81	0.78	0.77	0.76	0.75	0.75	0.74	0.73	0.71	0.70	0.69	0.79

Source: Summary data on the forests in SR

Latest figures on the total current increment suggest a gradual increase in the volume of timber available in Slovak forests; contemporary age structure and progressive growing stock volume generate the rise.

Table 5.6 – 6 Trend of total current increment

Indicator	Year				
	1980	1993	2000	2004	2005
Total current increment (th <sup>3</sup> m <sup>3</sup> )	8 842	10 008	11 204	11 534	11 584
Total current increment / ha (m <sup>3</sup> )	4.75	5.19	5.83	6.07	6.10
Felling volume (th <sup>3</sup> m <sup>3</sup> )	5 864	4 185	6 218	7 268	10 190*
Felling volume / TCI (%)	66.3	41.8	55.5	63.0	88.0

Source: Summary data on the forests in SR

\*In 2005 felling volume was influenced by processing wood from wind calamity of November 2004

Table 5.6 – 7 Total current increment by forest category

Total current increment (TCI) / year	Category					
	Commercial		Protection		Special-purpose	
	Together (ths m <sup>3</sup> )	per ha (m <sup>3</sup> )	Togheter (ths m <sup>3</sup> )	per ha (m <sup>3</sup> )	Togheter (ths m <sup>3</sup> )	per ha (m <sup>3</sup> )
2005	8 190	6.31	1 511	4.92	1 883	6.40
2004*	7 982	6.21	1 500	4.60	1 980	6.42
2003	7 911	6.20	1 482	4.87	2 059	6.47
2002	7 874	6.15	1 449	4.84	2 068	6.52
2001	7 724	6.08	1 408	4.79	2 166	6.53

Source: Summary data on the forests in SR, 2006

\*Forest Information Centre (Lesoprojekt Zvolen) corrected 2004 TCI figures for particular functional forest categories in the Summary data on the forests in SR (May 2005)





## 6. FOREST MONITORING

### 6.1. NATIONAL FOREST INVENTORY AND MONITORING

Credible and up-to-date forest information synthesized from a wide variety of sources creates one of the main prerequisite for sustainable management of forest resources. With the ever-increasing importance of forests for the society and the environment, the demand for accurate and comprehensive information has significantly grown in recent years. In response to this increase, the Ministry of Agriculture supported a launch of the first national forest inventory and monitoring scheme (NFIM) in 2005. The main objective of this newly introduced scheme is to ensure that forest managers, policy makers and general public get access to periodically updated comprehensive set of forest data covering all aspects of forest resource management on both a national and regional level.

National forest inventory (NFI) uses selective methods based on temporary sample plots with forest data collected to a specific point-in-time. Forest monitoring, on the other hand, is defined as periodic repeating of national forest inventory (§ 46 of the Act No. 326/2005 of the Digest on forests).

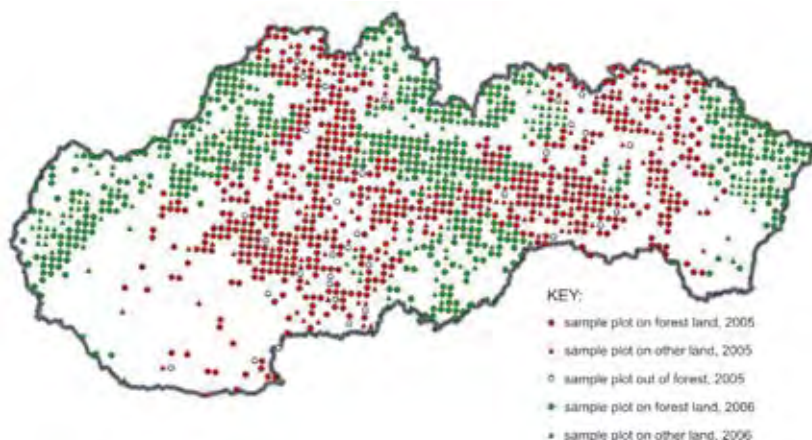
Following the decision of the Ministry of Agriculture of the Slovak Republic No. 3473/2004-710 of July 1 2004, the first phase of a 2-year NFI field sampling cycle was launched in 2005. The responsibility for data collection, controlling, task coordination and methodological support was delegated to the FRI Zvolen. Practical field sampling including the establishment of sample plots was secured in cooperation with the Lesoprojekt Zvolen (four 3-member crews) and the Euro Forest. s. r. o. (1 crew) in a  $4 \times 4$  km sampling grid; the grid covers all area with forest vegetation, both the forest lands as well as other lands including forested farmland. In 2005, 776 sample plots out of the total number of 1 485 were investigated.



*Figure 30 National Forest Inventory will provide a comprehensive set of objective and up-to-date data on forest condition and its changes*



A combination of common forest mensuration equipment and latest technology (GPS, Field-Map) is used for forest data collection in the field. The scope of investigation is rather substantial as over 100 variables are routinely recorded on an each plot.



*Figure 31 Location of sample plots on a national inventory and monitoring grid in SR*

In the next step, the collected data is processed and outputs are delivered to clients in the structure and format agreed. The outputs comprise information on the following: forest area, forest production (No. of trees, growing stock, log grades, forest structure, forest regeneration, timber quality, silviculture standard), forest condition, forest damage, site conditions, ecological conditions (soil type, forest site type, functional type, degree of naturalness, damage risk, ecological stability, biodiversity, deadwood, forest game fodder, forest margins, etc.), other forest-related issues (forest road network, watercourses and water resources).

## 6.2. Forest condition monitoring

Monitoring of forest condition covered 108 permanent sample plots (PSP) in a  $16 \times 16$  km grid using an extensive method of forest monitoring (ICP Forests/EU Level I). Seven PSP were also subject to intensive long term monitoring of forest ecosystems within the Level II programme.

Both monitoring levels fall in line with ongoing European monitoring programmes and initiatives. The data collected in monitoring are on a regular basis forwarded to the coordination centre of the ICP Forests Programme in Hamburg. Extensive monitoring of 2005 forest condition included, among others, also defoliation assessment on 4 993 sample trees. Intensive monitoring covers 7 permanent plots on a year-round basis and includes the following: defoliation assessment, sampling and analyses of assimilation organs, increment measurements, deposition assessment, soil solution sampling, air quality assessment, phenologic and ozone damage assessment).

In 2005 monitoring results showed a noticeable decrease in the average defoliation of the majority of Slovak forest tree species except for pine.



*Figure 32 Intensive monitoring is carried out on the Level II permanent monitoring plots*

*Table 6.2 – 1 Average defoliation by species (68% accuracy level)*

Species	Average defoliation in % $\pm$ mean error					
	1988	1990	1995	2000	2004	2005
Spruce	28.4 $\pm$ 1.2	28.5 $\pm$ 1.2	31.9 $\pm$ 1.1	28.2 $\pm$ 1.2	26.4 $\pm$ 0.7	26.4 $\pm$ 0.9
Fir	30.5 $\pm$ 3.5	36.8 $\pm$ 3.6	31.6 $\pm$ 3.0	28.3 $\pm$ 2.9	26.8 $\pm$ 1.1	25.1 $\pm$ 1.1
Pine	44.8 $\pm$ 2.8	43.7 $\pm$ 2.9	32.8 $\pm$ 1.9	22.0 $\pm$ 1.3	26.1 $\pm$ 1.3	26.6 $\pm$ 1.5
Larch	19.5 $\pm$ 3.9	29.6 $\pm$ 4.7	27.6 $\pm$ 1.7	20.3 $\pm$ 1.5	24.8 $\pm$ 1.7	24.6 $\pm$ 2.0
Conifers together	32.0 $\pm$ 1.5	32.8 $\pm$ 1.4	32.0 $\pm$ 0.9	26.5 $\pm$ 1.0	26.3 $\pm$ 0.5	26.2 $\pm$ 0.7
Beech	19.0 $\pm$ 1.3	17.2 $\pm$ 0.9	20.6 $\pm$ 1.1	14.9 $\pm$ 0.6	18.6 $\pm$ 0.6	17.1 $\pm$ 0.6
Oak	29.9 $\pm$ 2.2	30.6 $\pm$ 1.9	30.6 $\pm$ 1.2	23.3 $\pm$ 0.9	26.5 $\pm$ 1.1	25.0 $\pm$ 1.1
Hornbeam	13.5 $\pm$ 1.2	18.4 $\pm$ 1.5	21.8 $\pm$ 2.0	14.2 $\pm$ 1.1	19.8 $\pm$ 1.8	15.8 $\pm$ 1.5
Ash	23.0 $\pm$ 3.5	37.7 $\pm$ 5.2	33.4 $\pm$ 4.3	22.9 $\pm$ 2.5	26.0 $\pm$ 2.5	22.3 $\pm$ 2.5
Maple	35.0 $\pm$ 5.6	38.8 $\pm$ 5.6	28.0 $\pm$ 2.6	16.5 $\pm$ 1.5	22.2 $\pm$ 2.0	19.9 $\pm$ 1.2
Black locust	37.0 $\pm$ 3.5	73.8 $\pm$ 7.7	48.4 $\pm$ 6.1	39.8 $\pm$ 3.7	28.2 $\pm$ 5.0	28.0 $\pm$ 7.5
Broadleaved together	22.5 $\pm$ 1.3	24.7 $\pm$ 1.7	25.3 $\pm$ 1.2	18.3 $\pm$ 0.8	20.9 $\pm$ 0.7	19.2 $\pm$ 0.6
Total	26.5 $\pm$ 1.1	28.1 $\pm$ 1.3	28.1 $\pm$ 0.9	21.6 $\pm$ 0.8	23.2 $\pm$ 0.5	22.3 $\pm$ 0.6

*Source: FRI Zvolen*



## 7. MANAGEMENT IN FORESTS

### 7.1. Gene pool and reproductive material

#### 7.1.1. Forestry seed production inspection

Pursuant to the Act no. 217/2004 of the Digest on forest reproductive material Forestry seed production inspection (FSPI) secured:

- Approval and keeping central records of the sources of forest reproductive material (FRM) as well as the inspection of their management.
- Performance of state professional inspection of the production and use of FRM.
- Testing and checking of clones and multiclonal varieties of forest tree species.
- Keeping central register the producers of FRM, including registering reproductive material.
- Free of charge consultancy on forest seed production.
- Nursery management for the producers, owners and users of forest, including training and courses according to the requests of the organs of state forest administration and other subjects.

In 2005 the FSPI was aimed at management of seed sources, observance of the principles of horizontal and vertical transfer of reproductive material (122 subjects), production of FRM of forest tree species: collection and processing of seed (67 subjects), production of planting stock (192 subjects). There was carried out inspection of the quality of seed (specialized seed management laboratory accredited in ISTA): determination of the germination of 472 lots, determination of the purity of 123 lots, determination of the vitality of 73 lots, determination of water content for 18 lots, determination of the duration of pre-sowing preparation of 5 lots, determination of the germination of the lots in seed bank (222 lots).

Other activity was keeping central records on seed sources, on persons – holders of the certificate on capability to work with FRM, on producers of reproductive material and central registering of reproductive material. FSPI organized also an international seminar “Actual problems of forestry seed production and management and nursery management 2005” with the participation of 135 representatives of forest practice, research and state administration as well as international meeting of the representatives of 12 official control organs of member and associated states in the EU “Possibilities of cooperation in applying the Directive of the Council 1999/105/EC on the trade with forest reproductive material”.

*Figure 33 The most suitable way of the preservation of the gene pool of forest tree species is their natural regeneration*





### 7.1.2. Sources of forest reproductive material

Approved stands of A and B category, seed orchards, plus trees and clones, seed stands, certified identified sources and gene reserves are the sources of FRM.

*Approved stands* for the collection of the seed of A and B category are the result of mass selection on the basis of phenotype quality. In 2005, the area of A category was 7 670 ha and the area of B category 52 735 ha. Despite negative consequences of windstorm of November 2004, the area of approved stands has dropped only by 87 ha. The drop in the area of the most affected tree species – spruce and fir – was compensated mainly by increasing the area of approved stands for oak.

Table 7.1.2 – 1 Area of approved stands according to categories and tree species

Tree species	Area of the category (ha)		Together
	A	B	
Norway spruce	3 690	15 665	19 355
Silver fir	484	3 876	4 360
Scotch pine	359	2 432	2 791
European larch	175	851	1 026
Oaks	578	6 753	7 331
European beech	2 270	22 280	24 550
Other tree species	114	878	992
Together	7 670	52 735	60 405

Source: FRI Zvolen



*Seed orchards* are special plantations for the production of high quality seed and for reaching regular, rich and easily harvestable crop. They are comprised of ramets of plus trees. They provide also for preservation of the gene pool “*ex situ*”.

Figure 34 Heartwood seed orchard of Silver fir established from generative progeny of plus trees

Table 7.1.2 – 2 Number and area of seed orchards according to tree species

Indicator	Species															Together
	SM	JD	BO	SC	BC	LB	DB	JH	JS	JL	LP	BR	SO	BH		
Number	3	1	24	37	3	4	2	2	3	1	1	1	1	1	84	
Area (ha)	4.0	2.3	58.9	105.7	8.8	6.3	3.0	1.7	2.3	1.0	1.5	0.4	0.3	0.5	196.5	

*Explanatory notes:* SM – spruce, JD – fir, BO – pine, SC – larch, BC – Austrian pine, LB – Swiss stone pine, DB – oak, BK – beech, JH – sycamore maple, JS – ash, JL – alder, LP – linden, BR – birch, SO – Serbian spruce, BH – elm,

Source: FRI Zvolen

*Plus trees* are being selected according to their extraordinary high quality whereas also resistance against injurious agents is taken into account. They serve mainly for establishing seed orchards as well as the source of seed for the preservation of the gene pool and future breeding. In 2005 there have been selected mainly new plus trees of valuable broadleaved tree species as well as of Norway spruce, Scots pine and European larch.



Figure 35 Seed orchards or larch provide the crop of high quality seed that can be collected easily

Table 7.1.2 – 3 Number of plus trees according to tree species

Indicator	Tree species														Together
	SM	JD	BO	SC	BC	OI*	DB	BK	JH	JS	JL	LP	BH	OL**	
Number	234	162	862	977	89	321	463	44	98	210	161	112	87	445	4 265
Proportion (%)	5.5	3.8	20.3	22.9	2.1	7.5	10.9	1.0	2.3	4.9	3.8	2.6	2.0	10.4	100.0

Explanatory notes: SM – spruce, JD – fir, BO – pine, SC – larch, BC – pine, OI\* – Other conifers, DB – oak, BK – beech, JH – sycamore maple, JS – ash, JL – alder, LP – linden, BH – elm, OL\* – other broadleaved

Source: FRI Zvolen

*Seed stands* are progeny of the most valuable partial populations of forest tree species that excel in their resistance, production capacity and quality. They are established by planting generative progeny as well as by approval of natural regeneration of high quality parent stands.

Table 7.1.2 – 4 Area of seed stands according to tree species

Indicator	Tree species						Together
	Spruce	Fir	Pine	Larch	Beech	Oak	
Area (ha)	282	90	53	46	184	120	775
Proportion (%)	36.4	11.6	6.8	5.9	23.8	15.5	100.0

Source: FRI Zvolen

*Gene reserves.* To 31 December 2005 Forestry Seed Production Inspection kept records on 85 gene plots with the area 28 897 ha. In 2006 there is prepared documentation for approval for 17 gene plots with the area 3 580 ha, and after processing calamity in the High Tatras Mts. it will be necessary to review 10 gene plots with the area 3 780 ha.

In the Forest Seed Bank there have been stored at the end of 2005 722.9 kg of the seeds composed of 300 lots of six species of coniferous tree species. With regard to the drop in the quality of lots stored in the “old part” of the bank in 2006 there will be prepared a proposal for discard of some parts of lots from the supplies of the seed bank.

### 7.1.3. Production of Forest tree seeds

Mostly the enterprise Semenoles Liptovský Hrádok affiliated with Lesy SR, š. p. deals with processing and storing the seeds of forest tree species. The enterprise provides storing a part of supplies on lease for other owners and remaining part of supplies the other owners store directly in their storehouses.

*Table 7.1.3 – 1 Supplies of the seed of forest tree species according to the location of their storage and their comparison with optimal supplies*

Indicator	Tree species (kg)						
	Spruce	Larch	Pine	Dwarf pine	Fir	Beech	Oak
Supplies in OZ Semenoles	1 657	615	908	73	2 084	4 925	11 238
– storing on lease	634	167	226	34	246	54	—
Supplies of other owners	529	42	203	9	2 746	230	40
Supplies together	2 186	657	1 111	82	4 830	5 155	11 278
Optimal supplies	2 037	1 163	1 591	90	5 580	56 317	Not given
Difference	+149	-506	-480	-8	-750	-51 162	

*Source: FRI Zvolen, Lesy SR, š. p., Banská Bystrica, OZ Semenoles Liptovský Hrádok*

### 7.1.4. Forest nurseries



*Figure 36 Due to growing proportion of natural regeneration the production of planting stock is dropping*

To 31 December 2005 FSPI kept records on 288 holders – private persons with the certificates certifying their capability to work with forest reproductive material, 130 legal entities and 43 holders via other private person. To the same date 166 persons requested for registering planting stock, while five of them are not the holders of the mentioned certificate (thus their request was rejected).

In the 2005 there was recorded a marked drop in the area of nurseries as well as in the area of production plots, mainly in state sector as a result of reorganization of nursery and seed production activities at the national state forest enterprise Lesy SR, š. p. The decrease of the production of planting stock is being caused mainly by lower demand connected with growing proportion of natural regeneration of forest stands.

Table 7.1.4 – 1 Area of nurseries and their production area in state and non-state sector

Year	Total area of nurseries in (ha)		Production area of nurseries in (ha)	
	State sector	Non-state sector	State sector	Non-state sector
2001	484	626	329	435
2002	600	198	381	151
2003	521	167	360	116
2004	520	160	350	119
2005	372	138	279	100

Source: FRI Zvolen

Table 7.1.4 – 2 Production of planting stock in state and non-state sector

Year	Production of plants (ths pcs)		
	State sector	Non-state sector	Together
2001	113 802	73 895	187 697
2002	149 731	64 816	214 547
2003	120 232	50 538	170 770
2004	111 582	61 027	172 609
2005	91 649	59 751	151 400

Source: FRI Zvolen

## 7.2. Silviculture

### 7.2.1. Regeneration of forest stands

In the beginning of 2005 there were 16 854 ha of clearings for regeneration in total. This area has extended by other 15 935 hectares during the year. Not successful regeneration on the plot of 1 769 ha represents 20% of total artificial regeneration.

Of the total area of clearings - 32 789 ha, 4 532 ha were reforested by natural regeneration. State forestry administration permitted exceptions from 2 year period for forest regeneration concerning 1 752 ha. At the end of 2005 there remained clearings with the area 19 285 ha. The area of clearings has increased in comparison with 2004 by 2 431 ha. Soil preparation for artificial regeneration was done on the area of 10 172 ha and for natural regeneration on the area of 856 ha.

Table 7.2.1 – 1 Extent of regeneration of forest stands in ha

Regeneration in the year (2005)	State organizations	Non-state subjects	Together
Clearing in the beginning of 2005	10 057	6 797	16 854
In 2005 there accrued together:	9 546	6 389	15 935
– Due to felling	7 782	5 451	13 233
– Due to unsuccessful regeneration	1 033	736	1 769
– On the plot arisen pursuant to § 6 part. 7	223	113	336
– Due to natural disasters	84	33	117
– Natural regeneration without felling area	389	22	411
– Other reasons	35	34	69



Table 7.2.1 – 1 – contd.

Regeneration in the year (2005)	State organizations	Non-state subjects	Together
In 2005 there decrease together:	8 059	5 445	13 504
– Due to artificial regeneration	5 200	3 629	8 830
– Due to natural regeneration	2 774	1 758	4 532
– Due to other reasons	85	58	142
State of clearing at the end of 2005	11 544	7 741	19 285
– Of that permitted exceptions	884	868	1 752

Source: Summary data on the forests in SR, 2006

Table 7.2.1 – 2 Ways of regeneration of forest stands in ha

Clearings loss	New tasks of regeneration		Repeated regeneration	Together
	Planting, sowing	Underplanting, undersowing		
Artificial regeneration	6 412	206	2 212	8 830
Natural regeneration	4 092	393	47	4 532
Together	10 504	599	2 259	13 362
Due to other reasons	113	3	26	142

Source: Summary data on the forests in SR, 2006



Figure 37 Proportion of artificial forest regeneration is decreasing



Figure 38 The proportion of natural forest regeneration is growing

It is evident from following table the total extent of regeneration and of artificial regeneration of forest stands has been decreasing. The proportion of natural regeneration has been growing.

Table 7.2.1 – 3 Development of regeneration of forest stands in ha

Kind of regeneration	Year			
	1990	2000	2004	2005
Artificial regeneration	15 500	12 923	8 866	8 922*
Natural regeneration	3 454	2 134	5 094	4 582*
Total regeneration	18 964	15 057	13 960	13 504
Proportion of natural regeneration (%)	18.2	14.2	36.5	33.9

Source: Summary data on the forests in SR

\*Artificial and natural regeneration adjusted by clearing loss due to other reasons

### 7.2.2. Care about young forest stands

Shrubs cutting and cutting of undesirable tree species were carried out on the area 11 382 ha, of that 8 018 ha in the forests being in the use of state organizations and 3 364 in the use of non-state subjects. Data on the protection of cultures (plantations) are presented in part 7.4.2.

### 7.2.3. Cleaning in forest stands

In 2005 cleanings were carried out on smaller area than planned by 1 664 ha. This was recorded in non-state forests, where cleanings were conducted only on the area 9 514 ha what was less by 23% than the planned 12 374 ha. In state forests the area of cleanings was higher by 1 195 ha than planned.

Table 7.2.3 – 1 Extent of planned and executed cleaning in ha

Indicator	State organizations	Non-state subjects	Together	Fulfilment of plan in %
Plan	18 369	12 374	30 743	94.6
Existing situation	19 564	9 514	29 079	

Source: Summary data on the forests in SR, 2006

The extent of planned and executed cleanings has been dropping since 2000.

Table 7.2.3 – 2 Development of the extent of planned and executed cleaning in ha

Indicator	Year			
	1990	2000	2004	2005
Plan	33 994	34 668	31 532	30 743
Existing situation	34 143	34 936	30 315	29 079

Source: Summary data on the forests in SR

### 7.2.4 Thinning in forest stands

In 2005 thinning was carried out on the area smaller by 12 248 ha than planned. This decrease was recorded in state forests (by 7 377 ha) and in non-state forests (by 4 871 ha). It was caused mainly by postponing of intentional tending felling due to a great volume of processing timber from incidental felling in mature as well as premature stands.

Table 7.2.4 – 1 Extent of planned and executed thinning

Indicator	State organizations	Non-state subjects	Together	Plan of fulfilment in %
Plan (ha)	34 632	23 686	58 318	79.0
Existing situation (ha)	27 255	18 815	46 070	
Plan (m <sup>3</sup> )	786 970	497 584	1 284 554	168.4
Existing situation (m <sup>3</sup> )	1 319 278	843 940	2 163 218	

Source: Summary data on the forests in SR, 2006

Due to high volume of incidental felling in premature stands is also the volume of actually executed tending felling higher than planned in a long-term. In the year 2005 there was



extraordinarily high volume of premature incidental felling reaching 1 225 180 m<sup>3</sup> (Table 7.3.1 – 2) and mature incidental felling in premature stands (1 735 669 m<sup>3</sup>) caused mainly by processing calamity wood after windstorm in November 2004. Very critical situation is in case of coniferous tree species. Their proportion in total volume of incidental felling in premature stands was more than 90%.

*Figure 39 In 2005 the volume of processed calamity wood in premature stands was almost 3 million m<sup>3</sup>*

*Table 7.2.4 – 2 Development of the extent of planned and executed thinning*

Indicator	Year			
	1990	2000	2004	2005
Plan (ha)	63 397	61 111	59 067	58 318
Existing situation (ha)	37 143	53 938	55 982	46 070
Plan (m <sup>3</sup> )	1 190 418	1 220 469	1 275 606	1 284 554
Existing situation (m <sup>3</sup> )	1 896 279	1 926 010	2 075 896	2 163 218

*Source: Summary data on the forests in SR*

## 7.3. Logging

### 7.3.1. Timber felling

In the year 2005 there was felled in the forestry of Slovakia more than 10.2 million m<sup>3</sup> of wood, of that 6.9 million m<sup>3</sup> of conifers. An increase by almost 3 million m<sup>3</sup> in comparison with 2004 was caused by wind calamity of November 2004. The result of this disaster was 64% of incidental felling of the total timber felling (almost 89% of coniferous trees felling and 12% of broadleaved trees felling).

In the interest as quick as possible and effective processing of wood from wind calamity as well as with the aim to eliminate a possible expansion of bark beetles there were used broadly harvester technologies; in the State Forests of the Tatra National Park it was 53% of the total volume of processed calamity wood. In the Lesy SR, š. p., the proportion of harvester technologies reached 8%.

Table 7.3.1 – 1 Development of realized timber felling

Indicator	Year							
	1990		2000		2004		2005	
	Executed felling (ths m³ of wood with dbh > 7cm u.b. and of that incidental felling (ths m³ of wood with dbh > 7cm u.b. / %							
Coniferous	2 777	1 838	3 245.0	2 012	4 000.7	2 550.0	6 927.4	6 152.7
		66.2		62.0		63.9		88.8
Broadleaved	2 499	766	2 973.0	1 010	3 267.4	361.0	3 263.1	380.3
		30.7		34.0		11.0		11.7
Together	5 276	2 604	6 218.0	3 021	7 268.1	2 916.0	10 190.5	6 533.0
		49.3		48.6		40.1		64.1

Source: Summary data on the forests in SR



In state forest organizations there was felled 6.519 million m<sup>3</sup> (64%) of wood, of that 4.442 mil. m<sup>3</sup> of coniferous wood and 2.077 mil. m<sup>3</sup> of broadleaved wood. In non-state sector there was felled 3.695 million m<sup>3</sup> (36%) of wood, of that 2.499 mil. m<sup>3</sup> of coniferous and 1.196 mil. m<sup>3</sup> of broadleaved wood.

Figure 40 Harvester technologies enable in suitable field conditions quick and effective processing of wood

Table 7.3.1 – 2 Volume of timber felling according to the kind of felling and use of forests

Forests in the use of	Tree species	Felling									
		M	Regeneration			Tending			Together		
		Felling (ths m³ of wood with dbh > 7cm u.b. / of that incidental felling (ths m³ of wood with dbh > 7cm u.b. / % of incidental felling)									
State organiz.	C	6.5	3 644.0	3 434.6	94.3	791.0	680.3	86.0	4 435.0	4 114.9	92.8
	B	4.7	1 544.1	168.2	10.9	528.3	72.6	13.7	2 072.4	240.8	11.6
	Σ	11.2	5 188.1	3 602.8	69.4	1 319.3	752.9	57.1	6 507.4	4 355.7	66.9
Non-state subjects	C	6.9	1 957.6	1 611.3	82.3	534.8	426.4	79.7	2 492.4	2 037.7	81.7
	B	4.9	881.6	93.7	10.6	309.1	45.9	14.8	1 190.7	139.6	11.7
	Σ	11.8	2 839.2	1 705.0	60.1	843.9	472.3	56.0	3 683.1	2 177.3	59.1
Together	C	13.4	5 601.6	5 045.9	90.1	1 325.8	1 106.8	83.5	6 927.4	6 152.7	88.8
	B	9.6	2 425.7	261.9	10.8	837.4	118.4	14.1	3 263.1	380.3	11.7
	Σ	23.0	8 027.3	5 307.8	66.1	2 163.2	1 225.2	56.6	10 190.5	6 533.0	64.1

Source: Summary data on the forests in SR, 2006

Explanatory notes: C – coniferous, B – broadleaved, M – extraordinary felling



### 7.3.2. Timber transport (skidding and hauling)

In 2005 there was skidded in the forest sector of SR 9,305 million m<sup>3</sup> of timber what was less by 0.907 million m<sup>3</sup> than the volume of felled timber. The difference is caused by leaving a part of felled calamity stumpage in the national parks TANAP and NAPANT according to the requirements of the organs of state nature conservation (623.8 thousand m<sup>3</sup>), sale of stumpage (135.1 thousand m<sup>3</sup>) and own production of wood (148.1 thousand m<sup>3</sup>). 3% of timber was skidded by the own means of mechanization.

Total volume of timber skidding in the state forest organizations has increased by 2.396 million m<sup>3</sup> in comparison with 2004.

Table 7.3.2 – 1 Development of timber skidding

Organizations		Year (ths m <sup>3</sup> )			
		1990	2000	2004	2005
State	Under Ministry of Agriculture of SR (MA SR)	4 728	3 509	3 857	5 889
	Other	469	345	333	397
	Together	5 197	3 854	3 890	6 286
Non-state subjects		0	Not found	1 151*	3 019
Together		5 197	3 854	5 341	9 305

Source: Statistical reports of MA SR; FRI Zvolen

\*Volume of skidding only from selection set of non-state



The proportion of universal wheeled tractors was 50.7% in total volume of timber skidding in state forest organizations, followed by forestry wheeled tractors with 28.9%, forwarders 17.5%, forest cableways 2.1%, then horses with 0.8%, tracked tractors 0.05% and helicopters 0.03%

Figure 41 Proportion of ecological timber skidding with help of horses is not even 1%

In timber skidding by own means of mechanization of state forest organizations (except for trade companies and skidding performed on contract) there prevailed forest wheeled tractors. Their proportion (68.5%) increased by 6.3% in comparison with 2004. The proportion of forest cableways increased by 6.4% in comparison with 2004, and it reached 13.9% in 2005.

Table 7.3.2 – 2 Structure of timber skidding by own means of mechanisation in state organizations

Skidding means		Year (%)			
		1990	2000	2004	2005
Horses		1.7	11.8	6.1	2.7
Winches portable and self-propelled		0.6	—	—	—
Forest cableways		1.7	2.5	7.5	13.9
Tractors	Tracked	2.0	1.6	0.1	—
	Universal wheeled	31.0	30.0	22.0	14.0
	Forestry wheeled	63.0	52.5	62.2	68.5
Forwarders		—	0.6	2.1	0.9

Source: Statistical reports of MA SR; FRI Zvolen

In state forest organizations almost 79% of timber was hauled in 2005 in whole length. In non-state forests almost 18% of timber was hauled in whole length. The supplies at the roadside landing and timber yards are in fact the difference between the volume of skidded timber and hauled timber (18 thousand m<sup>3</sup>).



Figure 42 Skidding of whole trees prevails in state forest organizations

Table 7.3.2 – 3 Development of timber hauling/transport

Organizations		Year (ths m <sup>3</sup> )			
		1990	2000	2004	2005
State	Under the Ministry of Agriculture of SR (MA SR)	4 266	3 167	3 788	6 278
	Others	469	345	342	490
	Together	4 735	3 512	4 130	6 768
Non-state subjects		0	Not found	911*	2 519
Together		4 735	3 512	5 041	9 287

Source: Statistical reports of the Ministry of Agriculture of SR; FRI Zvolen

\*Volume of hauling only from the set of non-state subjects

### 7.3.3. Making access to forests through transport network

According to available data, average density of forest road network in Slovakia is 18.5 m.ha<sup>-1</sup>. In the year 2005 the total length of forest roads has increased by 9 km. There were constructed new roads in the forests belonging to state forest organizations, namely 3 km of forest roads of the class 2L and 3 km of the class 3L.



Figure 43 Making access to forests through transport network has been stagnating for long time

Table 7.3.3 – 1 Structure of forest road network

Kinds of roads		Year 2004		Year 2005	
		Length (km)	Density (m.ha <sup>-1</sup> )	Length (km)	Density (m.ha <sup>-1</sup> )
Own roads	Main forest roads of the class 1L (With roadway)	6 354	3.2	6 354	3.2
	Main forest roads of the class 2L (Locally enforced)	14 835	7.4	14 839	7.4
	Ground roads of the class 3L + TPC	15 887	7.9	15 907	7.9
	Together	37 076	18.5	37 096	18.5
Other roads – main forest roads, class 1L		3 212	1.6	3 212	1.6
Together (own and other)		40 288	20.1	40 308	20.1

Source: Special investigation of FRI Zvolen

Explanatory notes: 1L – main forest road with roadway enabling whole-year using; 2L – forest road without roadway, with local enforcement by stones enabling seasonal using; 3L – ground forest road constructed with the parameters of forest roads enabling under favourable geological and climatic conditions timber hauling; TPC – permanent skidding ground road with maximal longitudinal slope within 20%

## 7.4. Forest protection

### 7.4.1. Forest Protection Service

Forest Protection Service is in accordance with the § 29 of the Act no. 326/2005 of the Digest on forests the organ of state professional control of forest protection. The tasks of the Service following from this act are checking the fulfilment of the duties in forest protection, effectiveness of performed measures to improve the health condition of the forest.

The FPS secured in 2005 monitoring of the health condition of forest and the occurrence of injurious agents, worked out prognoses of the trends of injurious agents and published signalisation reports. It fulfilled also the tasks in the plant-medical care in the field of forestry in accordance with the Act no. 193/2005 of the Digest on plant-medical care. It performed expertise, consultancy and educational activities, reviewed projects aimed at forest protection, prepared measures for elimination of shortcomings as well as provided data for the construction of information system.

### 7.4.2. Preventive protection measures

In 2005 within the protection of young forest stands there were carried out preventive protective measures against weed on the area of 36 502 hectares. Protective measures against game were carried out on the area of 29 213 ha. 241 ha of plantations (270 km) were fenced. There was constructed a fence long 9 km for the protection of grazing. Liberation cutting and cutting of shrubs was performed on the area of 11 382 ha.



*Figure 44 Prevention protection measures against browsing by red deer*

### 7.4.3. Protection and defence against injurious agents

In 2005 the greatest attention was paid to the protection and defence against bark beetles. For trapping of bark beetles there were laid 15 830 traditional trap trees and installed 40 291 pieces of pheromone traps. The traps were equipped with 77 877 pieces of pheromone lures. For example in Brezno district there were installed 10 660 traps, in Poprad district 5 059, Kežmarok 3 126, and in Čadca 3 074 traps.

Aerial treatment of the plots with not processed calamity wood before the beginning of summer swarming of bark beetles was conducted at the affiliated forest enterprise Beňuš on the area 404 ha by the preparation Vaztak 10 EC. Then in Municipal forests Brezno 146

ha and in the region of Levočské hills 208 ha (Military forests and estates Kežmarok, Municipal forests Lubica, Communal forests Ihl'any).



In the national state forest enterprise Lesy SR, š. p., Banská Bystrica there was carried out ground treatment of calamity wood by the preparation Cyples at the amount of about 186 thousand m<sup>3</sup> (OZ: Beňuš, Čierny Balog, Liptovský Hrádok, Námestovo, Rožňava, Revúca). The subjects reported more than 290 ths m<sup>3</sup> of round wood treated by synthetic pyrethroids (districts Brezno, Revúca and Čadca).

*Figure 45 Some ten thousands of pheromone traps are installed every year for trapping of bark beetles*



Table 7.4.3 – 1 Used means for forest protection against bark beetles and woodborers

Insect	Trap trees			Pheromone traps			Chemically treated
	Slight	Moderate	Heavy	Slight	Moderate	Heavy	
	pcs			pcs			
Eight-toothed spruce bark beetle ( <i>Ips typographus</i> L.)	3 282	3 892	6 828	10 899	10 102	8 752	224 373
Pine bark beetle ( <i>Pityogenes chalcographus</i> L.)	161	253	134	4 056	2 926	2 466	69 393
Conifer ambrosia beetle ( <i>Xyloterus lineatus</i> )	—	—	—	584	77	105	1 700
Pine beetles	0	27	0	—	—	—	0
European oak bark beetle ( <i>Scolytus intricatus</i> )	87	35	21	—	—	—	0
Northern bark beetle ( <i>Ips duplicatus</i> )	—	—	—	199	14	0	0
Other species	—	—	—	—	—	—	0
Together	3 530	4 207	6 983	15 738	13 119	11 323	295 466

Source: FRI Zvolen

#### 7.4.4. Remediation measures in forests damaged by air pollutants

Remediation measures in the forests damaged by air pollutants were directed in accordance with the Programme on elimination of damage in forest ecosystems by the year 2010. The Ministry of Agriculture of SR as well as the government of SR approved this programme in 2002. Financing of the measures was secured from own as well as from public sources. Agrarian Payment Agency approved 79 projects for non-state sector within Sectoral Operational Programme “Agriculture and Rural Development”, sub-measure 2.1.2. They included also remediation measures in the forests damaged by air pollutants. These measures were frequently combined with eliminating the consequences of natural agents as well as with other measures aimed at restoration of production and public beneficial forest functions. In total there were running 25 projects with the price about 67 million SKK. But the extent of the implementation was very low in 2005.

#### 7.4.5. Forest fire control and prevention

In 2005 Aerial Forest Fire Control Service secured protection of forests in Slovakia against forest fires. It was established in 2001. The Directive if the Ministry of Agriculture of SR and the Ministry of Interior of SR no. 1344/40/2003-700 of 18 February 2003 on aerial service during monitoring and extinguishing forest fires governs the activities of the Service. State forest enterprise Lesy SR, š. p., Banská Bystrica coordinated prevention against forest fires in the forests with the activities of Aerial Forest Fire Control Service. The owners and users of forest lands who are obliged to do it as it follows from generally binding legal norms performed ground protective and preventive service against forest fires. They reported found forest fires to Firemen and Rescue Corps and organized forest fire extinguishing until arrival of Firemen and Rescue Corps.

In the year 2005 the Act no. 326/2005 of the Digest on forests came into force, then the amended Act no. 314/2001 of the Digest on protection against fires as well as amendment of executive regulation no. 121/2002 of the Digest on fire prevention. The Act no. 326/2005 of the Digest on forests imposes on/to the managers of forests to carry out preventive measures against forest fires in accordance with the Act no. 314/2001 of the Digest and related executive regulations. A new element in the act on forests is the duty to perform aerial forest fire control monitoring. It is secured financially from the state budget.



*Figure 46 Higher risk of fire is in calamity areas in the period of drought*

### 7.5. Forestry technical standardization

Forestry technical standardization was governed in 2005 Technical Commission no. 6 – Forestry established by the Slovak Institute for Technical Standardization Bratislava. According to the plan of the Technical Commission following works have been performed in the year 2005:

- Incorporation of the provision of the Regulation of the government of SR no. 86/2005 of the Digest on classification of raw timber into the implementation of the Directive 68/089/EEC on approximation of the laws of the member states
  - Revision of recommended rules for timber sorting in Slovakia
  - Revision of the Slovak technical standard (STN) 48 0055 Qualitative sorting of coniferous round wood
  - Reworking of the standard STN 48 0056 Qualitative sorting of broadleaved round wood
- Elaboration of a new STN 48 0030 Multi-operation technologies in forestry
- Revisions of the standards:
  - STN 48 0202 Round wood. Industrial tree species. Nomenclature.
  - STN 48 2211 Silviculture. Seedlings and plants of forest tree species.
  - STN 48 2716 Forest protection. Protection of seedlings and plants in forest nurseries.

In the year 2005 there were not issued new Slovak technical standards.





## 8. TIMBER TRADE

The most important source of revenues for the preservation of forest functions and maintaining jobs in forest sector is sale of timber that secures in a long-term about 80% of sales and profits for forestry.

### 8.1. Deliveries of timber to domestic consumers

At domestic market there have been still applied timber deliveries in accordance with the STN (Slovak Technical Standard) and the Decree of the government of SR no. 86/2005 of the Digest on raw timber classification, though already in 2000 Slovakia adopted several European standards for qualitative sorting of round wood issued by the Centre for European Standardization in Brussels. In the year 2005 the subjects managing forests in Slovakia delivered for domestic market 8 414 thousand m<sup>3</sup> of timber what has been the highest volume up to now. In comparison with the year 2004 it was more by 1 973 ths m<sup>3</sup> and with the year 1990 by 3 955 ths m<sup>3</sup> what was almost the double volume of the timber deliveries than in 1990. The reason for higher timber deliveries in 2005 was mainly processing of calamity wood due to windstorm in November 2004.

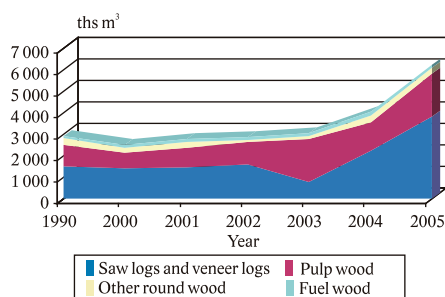


Figure 47 Deliveries of coniferous timber

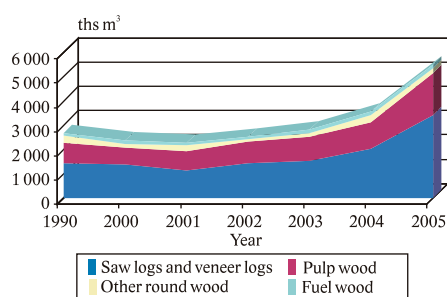


Figure 48 Deliveries of coniferous timber for domestic market

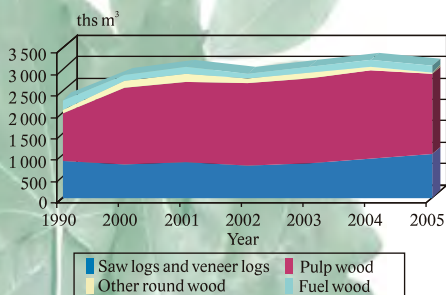


Figure 49 Deliveries of broadleaved timber

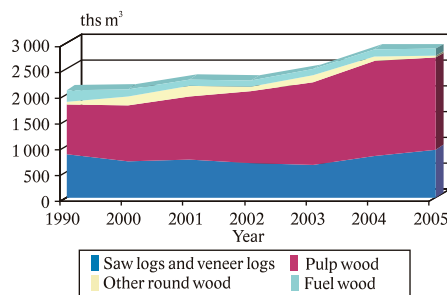


Figure 50 Deliveries of broadleaved timber for domestic market





Figure 51 Wood deliveries increased in 2005 in comparison with previous year by almost 2 million m<sup>3</sup> due to processing calamity wood

## 8.2. Timber production and consumption

In the interest of increasing employment rate and incomes of the population there has been more promoted processing of produced raw timber in domestic companies and increasing the added value for wood products. Data presented in following table confirm the implementation of this intention. A gradual increase of the production and consumption of basic assortments of raw timber in m<sup>3</sup> per capita is obvious from the presented data.

Table 8.2 – 1 Production and consumption of timber assortments per capita

Assortment	1990	2000	2004	2005
	m <sup>3</sup> per capita			
Round wood – production	0.865	1.082	1.346	1.729
Round wood – consumption	0.837	0.805	1.167	1.403
Industrial round wood – production	0.800	0.943	1.289	1.289
Industrial round wood – consumption	0.771	0.751	1.123	1.370
Pulpwood – production	0.343	0.488	0.631	0.671
Pulpwood – consumption	0.310	0.360	0.542	0.546

Source: Quarterly reports on timber deliveries in forest sector, Ministry of Agriculture of SR, Data of the Ministry of Economy, Statistical Office of SR and FRI Zvolen

## 8.3. Timber export and import

Since 1997 raw timber export has been liberalized. It follows from customs statistical data that 1 815 thousand m<sup>3</sup> of timber was exported in 2005. The owners and users of forest lands sold for export the timber at the amount 766 thousand m<sup>3</sup>, of that 606 thousand m<sup>3</sup> of coniferous timber and 160 thousand m<sup>3</sup> of broadleaved timber. Other subjects, mainly trade companies, exported the difference, namely 1 049 thousand m<sup>3</sup>.

Table 8.1 – 1 Assortment structure of raw timber deliveries

Assortment	Year 1990 (m³)				Year 2004 (m³)				Year 2005 (m³)				Year (%)		
	Inland	Export	Own consumption	Together	Inland	Export	Own consumption	Together	Inland	Export	Own consumption	Together	1990	2004	2005
<i>Coniferous timber</i>															
Veneer logs I class	15 210	—	—	15 210	345	597	136	1 078	405	145	1	551	0.61	0.03	0.01
Veneer logs II class	40 020	—	69	40 089	16 606	565	185	17 356	5 646	337	19	6 002	1.60	0.43	0.10
Saw logs	1 313 463	619	27 269	1 341 351	1 989 393	76 312	133 271	2 198 976	2 793 129	214 716	72 427	3 083 272	53.44	54.48	49.53
Poles	33 740	—	—	33 740	4 365	116	—	4 481	5 643	11 938	—	17 581	1.34	0.11	0.28
Pitwood	88 744	—	11	88 755	17 543	8 157	4 333	30 034	17 206	4 141	1 187	22 534	3.54	0.74	0.36
Thin poles	40 229	722	1 256	42 207	13 760	46	301	14 107	45 715	11 557	189	57 461	1.68	0.35	0.92
Pulpwood	711 484	21 527	10	733 021	1 101 427	198 311	37 216	1 336 954	1 210 654	1 210 654	194 992	9947	29.21	33.12	22.74
Forest chips	1 436	—	—	1 436	3 200	0	522	3 722	12 752	—	214	12 966	0.06	0.09	0.21
Fuel wood	132 305	—	3 067	135 372	143 969	266	11 188	155 423	139 358	2 117	6 654	148 129	5.39	3.85	2.38
Stumpage	—	—	—	—	85 672	0	481	86 154	750 181	80 805	177	831 163	—	2.13	13.35
Raw stems	—	—	—	—	184 577	292	3 064	187 933	540 535	85 620	3 164	629 319	—	4.66	10.11
Wrack round wood	—	—	78 691	78 691	—	—	—	—	—	—	—	—	3.14	—	0
Together	2 376 631	22 868	110 373	2 509 872	3 560 856	284 663	190 697	4 036 217	5 521 224	606 368	96 979	6 224 571	100.00	100.00	100.00

Table 8.1-1 – contd.

Assortment	Year 1990 (m³)				Year 2004 (m³)				Year 2005 (m³)				Year (%)	
	Inland	Export	Own consumption	Together	Inland	Export	Own consumption	Together	Inland	Export	Own consumption	Together	1990	2004
Broadleaved timber														
Veneer logs I class	27 713	—	—	27 713	5 805	1 439	21	7 265	4 069	1 847	—	5 916	1.22	0.23
Veneer logs II class	81 118	—	8	81 126	30 019	9 549	62	39 631	28 276	10 302	6	38 584	3.56	1.24
Saw logs	733 612	1 372	13 001	747 985	774 753	61 018	19 452	855 222	866 690	69 625	10 065	946 380	32.82	26.69
Poles	2 378	—	34	2 412	7 700	—	—	7 700	20 433	816	—	21 249	0.11	0.24
Pitwood	24 245	—	648	24 893	227	—	82	309	738	—	146	884	1.09	0.01
Pulpwood	963 081	140 147	331	1 103 559	1 839 909	212 897	6 945	2 059 751	1 725 376	76 959	4 907	1 807 242	48.43	64.29
Forest chips	26 419	5 780	721	32 920	19 493	376	158	20 027	5 446	330	—	5 776	1.44	0.63
Fuel wood	224 393	—	8 778	233 171	137 547	639	10 529	148 715	140 425	600	7 856	148 881	10.23	4.64
Pulpwood	963 081	140 147	331	1 103 559	1 839 909	212 897	6 945	2 059 751	1 725 376	76 959	4 907	1 807 242	48.43	64.29
Forest chips	26 419	5 780	721	32 920	19 493	376	158	20 027	5 446	330	—	5 776	1.44	0.63
Fuel wood	224 393	—	8 778	233 171	137 547	639	10 529	148 715	140 425	600	7 856	148 881	10.23	4.64
Stumpage	—	—	—	—	39 884	—	37	39 922	88 627	—	260	88 887	—	1.25
Raw stems	—	—	—	—	25 320	—	223	25 543	13 550	—	209	13 759	—	0.80
Wrack round wood	—	—	25 079	25 079	—	—	—	—	—	—	—	—	1.10	—
Together	2 082 959	147 299	48 600	2 278 858	2 880 657	285 918	37 510	3 204 085	2 893 630	160 479	23 449	3 077 558	100.00	100.00
Coniferous + broadleaved together	4 459 590	170 167	158 973	4 788 730	6 441 514	570 581	228 207	7 240 302	8 414 854	766 847	120 428	9 302 129	—	—
Sawn wood coniferous	—	—	—	—	85 637	25 533	7 756	118 926	57 886	7 740	1 271	66 896	—	—
Sawn wood broadleaved	—	—	—	—	7 962	2 684	1 833	12 479	1 360	1 302	364	3 026	—	—

Source: Quarterly report on timber deliveries in forest sector Les (MA SR) 2–04, Customs Directory of SR, Statistical Office of SR, data of FRI Zvolen

Note: Deliveries for export include only timber directly delivered by forest owners (users). Differences between the deliveries and sale of timber are caused by conversion of sawn wood deliveries, what the sale does not include. Sawn wood is converted to the assortments of veneer logs to pulwood by the coefficients, 0.65 for conifers and 0.70 for broadleaved. Deliveries of sawn wood for domestic market are added to the assortments for domestic market. Deliveries of sawn wood for export are added to the assortments for export. Deliveries include also timber used for the production of sawn wood for own consumption

Table 8.3 – 1 Export of raw timber assortments

Timber assortment	Volume (ths m <sup>3</sup> )		Proportion (%)	
	2004	2005	2004	2005
Coniferous veneer logs and saw logs	283	767	24.9	42.3
Coniferous Pulpwood and other industrial round wood	295	605	26.0	33.3
Broadleaved veneer logs and saw logs	133	111	11.7	6.1
Broadleaved Pulpwood and other industrial round wood	353	208	31.1	11.5
Fuelwood, forest chips, wood waste, sawdust and charcoal	72	124	6.3	6.8
Together	1 136	1 815	100	100

Source: Statistical Office of SR, Customs Directory of SR

Timber export has started to drop since 2000. An increase in the year 2005 to 1 815 thousand m<sup>3</sup> is the consequence of an urgent need to process calamity timber. It was exported from Slovakia 679 thousand m<sup>3</sup> of coniferous sawn wood and 145 thousand m<sup>3</sup> of broadleaved sawn wood, whereas of the mentioned volumes forestry subjects exported also 8 thousand m<sup>3</sup> of coniferous sawn wood and 1 thousand m<sup>3</sup> of broadleaved sawn wood.

Data on the import of raw timber assortments in the year 2004 and 2005 are given in following table.

Table 8.3 – 2 Import of raw timber assortments

Timber assortment	Volume (ths m <sup>3</sup> )		Proportion (%)	
	2004	2005	2004	2005
Coniferous veneer logs and saw logs	19	2	7.7	3.0
Coniferous Pulpwood and other industrial round wood	3	+	1.2	+
Broadleaved veneer logs and saw logs	12	5	6.1	7.5
Broadleaved Pulpwood and other industrial round wood	212	55	86.1	82.0
Fuelwood, forest chips, wood waste, sawdust and charcoal	1	5	0.4	7.5
Together	246	67	100	100

Source: Statistical Office of SR, Customs Directory of SR

Source: Quarterly report on timber deliveries in forest sector, Data of the Ministry of Economy and FRI Zvolen

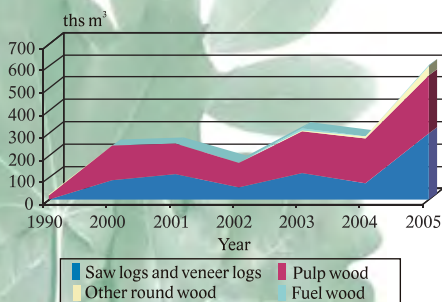


Figure 52 Export of coniferous timber by forestry subjects

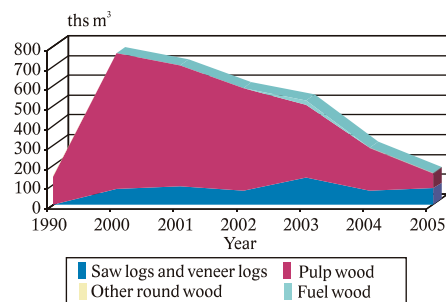


Figure 53 Export of broadleaved timber by forestry subjects





## 9. ECONOMICS OF FORESTRY

### 9.1. Sales and revenues in forestry

Sales and revenues have increased in 2005 in forestry by 19.9%. In state forest organizations the increase was 30.8% and in non-state subjects 0.2%. This difference follows first of all from greater volume of timber sale by state subjects, what means higher sales for timber.



Figure 54 The amount of sales for timber depends mainly on the quality of felled trees

Table 9.1 – 1 Sales and revenues in the forest sector of SR in current prices (Mil. SKK)

Subjects using forests	1990	1995	2000	2004	2005
State forests	4 531	5 118	6 504	7 423	9 708
Non-state forests	—	2 376	3 178	4 061	4 071
Together	4 531	7 494	9 682	11 484	13 779

Source: Summary data on forests in SR, 2006, Reports on Forestry in SR, Special questionnaire from forest owners and users, Sectoral statistical report

#### 9.1.1. Sales for timber

In 2005 there was sold more timber by 2 089 thousand m<sup>3</sup> (39.9%) including sawn wood calculated to rounwood than in 2004. The volume of sale represented 91.1% of the volume of realized felling. The remaining wood was used for own consumption or remained as supplied in respective localities. Timber sale has increased in total by 29.2%. Sales for timber have increased by 19.9%, of that by 0.6% in non-state sector and by 32.4% in state organizations.

Table 9.1.1 – 1 Timber sales in the forest sector of SR in current prices (Mil. SKK)

Subjects using forests	1990	1995	2000	2004	2005
State forests	2 604	3 540	4 621	5 768	7 635
Non-state forests	—	2 074	2 483	3 700	3 720
Together	2 604	5 614	7 104	9 468	11 355

Source: Summary data on forests in SR, 2006, Reports on Forestry in SR, Special questionnaire from forest owners and users, Sectoral statistical report

The increase of timber sales was influenced mainly by higher volume of timber sale despite decreased average monetization almost by 7% due to lower quality of calamity wood.

### 9.1.2. Timber prices for inland and export

Inland timber sale has increased almost by 28.9% and for export by 29.5%. Also in 2005 mainly coniferous timber contributed to the increase of timber sale inland, when the increase was almost 51.5%. For broadleaved timber the increase was zero.

Even more marked difference was recorded in timber sale for export, when of coniferous timber was sold more by 97.1% and of broadleaved timber less by 48.4% (table 9.1.2 – 1 and 9.1.2 – 2).

Total drop of average monetization of timber in the forestry of SR by 7% in 2005 when compared with 2004 results from almost equal relative reduction in monetization but various price levels in state forest sector and non-state forest sector.

This difference of monetization was 2.6% in favour of state sector. It followed from different proportion of coniferous timber in total volume of timber sale in state and non-state sector and its lower monetization in comparison with state sector by 3.2% because monetization of broadleaved timber in state as well as non-state forest sector was almost equal (+0.6% in favour of state sector).



Table 9.1.2 – 1 Sale, average monetization of timber and sales for timber in the forest sector of SR in the year 2005

No.	Assortment	Sale of timber assortments			Average price of timber assortments			Sales together		
		Inland	Export	Together	Inland	Export	Together	Inland	Export	Together
Coniferous timber										
1	Veneer logs I class	406	145	5 51	4 110	3 727	4 009	1 668 606	540 376	2 208 982
2	Veneer logs II class	5 665	337	6 002	3 132	3 438	3 149	17 740 918	1 158 484	18 899 402
3	Saw logs	2 872 683	225 585	3 098 268	1 626	1 595	1 642	4 670 885 847	359 755 318	5 030 641 165
4	Poles	5 643	11 938	17 581	1 351	1 242	1 277	7 624 216	14 823 061	22 447 277
5	Pit wood	18 393	4 141	22 534	1 502	1 268	1 459	27 625 133	5 252 823	32 877 956
6	Thin poles	45 812	11 581	57 393	716	1 032	780	32 821 184	11 957 202	44 778 386
7	Pulpwood	1 218 834	196 007	1 414 841	774	802	778	943 026 438	157 182 069	1 100 208 507
8	Forest chips	12 752	—	12 752	371	—	371	4 731 254	—	4 731 254
9	Fuelwood	139 358	2 117	141 475	396	394	396	55 221 985	833 130	56 055 115
10	Chosen assortments together (line 1–9)	4 319 546	451 851	4 771 397	1 334	1 221	1 323	5 761 345 581	551 502 463	6 312 848 044
11	Stumpage	750 181	80 805	830 986	654	613	650	490 254 062	49 526 485	539 780 547
12	Raw stems	540 550	85 620	626 170	1 001	792	973	541 315 699	67 815 467	609 131 166
13	Coniferous timber together	5 610 277	618 276	6 228 553	1 211	1 082	1 198	6 792 915 342	668 844 415	7 461 759 757
Broadleaved timber										
14	Veneer logs I class	4 069	1 847	5 916	9 898	9 482	9 768	40 275 835	17 513 069	57 788 904
15	Veneer logs II class	28 282	10 302	38 584	4 933	4 645	4 856	139 505 249	47 852 652	187 357 901
16	Saw logs	868 573	71 485	940 058	1 744	2 109	1 772	1 515 174 026	150 754 454	1 665 928 480
17	Pit wood	20 433	816	21 249	1 088	1 230	1 093	22 221 944	1 003 383	23 225 327
18	Thin poles	738	—	738	643	—	643	474 617	—	474 617
19	Pulpwood and unsorted wood	1 725 429	76 958	1 802 387	999	1 147	1 005	1 722 842 732	88 240 424	1 811 083 156
20	Forest chips	5 446	330	5 776	1 013	1 318	1 030	5 516 166	435 009	5 951 175
21	Fuelwood	140 425	600	141 025	721	880	722	101 261 746	527 802	101 789 548
22	Chosen assortments together (line 14 – 21)	2 793 395	162 338	2 955 733	1 270	1 887	1 304	3 547 272 315	306 326 793	3 853 599 108
23	Stumpage	88 627	0	88 627	317	—	317	28 063 754	—	28 063 754
24	Raw stems	13 550	0	13 550	866	—	866	11 730 460	—	11 730 460
25	Broadleaved timber together	2 895 573	162 338	3 057 911	1 239	1 887	1 273	3 587 066 529	306 326 793	3 893 393 322
26	Coniferous+ broadleaved timber together	8 505 850	780 614	9 286 464	1 220	1 249	1 223	10 379 981 871	975 171 208	11 355 153 079

Source: Sectoral statistical report



Table 9.1.2 – 2 Average timber prices in the forest sector of SR in SKK.m<sup>-3</sup>

No.	Assortment	Inland price			Export price			Inland + Export		
		2004	2005	2005/ 2004	2004	2005	2005/ 2004	2004	2005	2005/ 2004
Coniferous timber										
1	Veneer logs I class	3 161	4 110	1.30	3 317	3 727	1.12	3 248	4 009	1.23
2	Veneer logs II class	3 039	3 132	1.03	3 238	3 438	1.06	3 046	3 149	1.03
3	Saw logs	1 755	1 626	0.93	1 977	1 595	0.81	1 765	1 642	0.92
4	Poles	1 546	1 351	0.87	2 213	1 242	0.56	1 563	1 277	0.82
5	Pit wood	1 226	1 502	1.23	1 244	1 268	1.02	1 231	1 459	1.18
6	Thin poles	783	716	0.92	1 016	1 032	1.02	784	780	0.99
7	Pulpwood	871	774	0.89	834	802	0.96	865	778	0.90
8	Forest chips	246	371	1.51	—	—	—	246	371	1.51
9	Fuelwood	372	396	1.06	471	394	0.84	372	396	1.06
10	Chosen assortments together (line 1–9)	1 409	1 334	0.95	1 236	1 221	0.99	1 395	1 323	0.95
11	Stumpage	890	654	0.73	—	613	—	890	650	0.73
12	Raw stems	1 333	1 001	0.75	1 775	792	0.45	1 333	973	0.73
13	Coniferous timber together	1 394	1 211	0.87	1 237	1 082	0.87	1 381	1 198	0.87
Broadleaved timber										
14	Veneer logs I class	9 389	9 898	1.05	9 602	9 482	0.99	9 431	9 768	1.04
15	Veneer logs II class	5 095	4 933	0.97	5 016	4 645	0.93	5 076	4 856	0.96
16	Saw logs	1 825	1 744	0.96	2 093	2 109	1.01	1 845	1 772	0.96
17	Pit wood	1 031	1 088	1.05	—	1 230	—	1 031	1 093	1.06
18	Thin poles	529	643	1.22	—	—	—	529	643	1.22
19	Pulpwood and unsorted wood	917	999	1.09	1 147	1 147	1.00	941	1 005	1.07
20	Forest chips	1 067	1 013	0.95	1 063	1 318	1.24	1 067	1 030	0.97
21	Fuelwood	623	721	1.16	1 149	880	0.77	625	722	1.15
22	Chosen assortments together (line14–21)	1 218	1 270	1.04	1 526	1 887	1.24	1 246	1 304	1.05
23	Stumpage	363	317	0.87	—	—	—	363	317	0.87
24	Raw stems	855	866	1.01	—	—	—	855	866	1.01
25	Broadleaved timber together	1 203	1 239	1.03	1 526	1 887	1.24	1 232	1 273	1.03
26	Coniferous+ broadleaved timber together	1 310	1 220	0.93	1 375	1 249	0.91	1 315	1 223	0.93

Source: Sectoral statistical report

### 9.1.3. Other sales and revenues

Other sales and revenues in forestry have increased by 29.6% in 2005 when compared with previous year. The increase of this item was significantly higher in the sector of state forests (37.2%) than in non-state forests (-2.9%) (Tables 1, 3 and 9 given in the Annexes). This sources of revenues incorporates traditionally sale of the products of other forest production including plants, seed of forest tree species, game (venison) and similarly. Then it comprises also the associated production as well as the part of monetization of round wood in produced sawn wood for market and hunting, tourism and forestry services, engineering and other production. It comprises also revenues from the lease and sale

of forest property, revenues from financial capital and securities. The overview of a part of the production of other sales and revenues in state forests for the year 2005 is given in following table.

*Table 9.1.3 – 1 Structure of other forest production and associated production in state forest organizations for the year 2005*

Indicator			Measurement unit	Production	Sales (Ths SKK)
Other forest production	Production of Christmas trees		pcs	7 811	1 650
	Production of evergreens (coniferous branches)		kg	70	463
Associated production of goods and services	Production of sawn wood in associated wood production	Coniferous	m³	49 165	135 199
		Broadleaved		2 887	24 320
	Services in tourism (E.g. cottages for recreation, agro-tourism)		—	—	20 440
	Engineering production (production of machines, equipment)		pcs	19	38 253
	Services in engineering production (repairs, maintenance)		—	—	86 298
Together			—	—	306 623

*Source: State statistical finding MA SR (Special monitoring performed in state forest organizations)*



*Figure 55 In 2005 also the sales for the products of other forest production have increased*

#### 9.1.4. Support to forestry from public sources and its effectiveness

Support from public sources is being distinguished as to the support for **forestry** being represented by state organizations and non-state sector and for **forest sector**.

In addition to the mentioned forest sector includes also the organs of state administration of forestry and other organizations. In the year 2005 there was provided from public sources for forest sector the amount of 520.8 million. SKK of that for 197.5 mil. SKK was provided for forestry.

Table 9.1.4 – 1 Overview on providing public sources for forestry and forest sector in million SKK

Source	Current expenses	Capital expenses (investments)	Together
Forestry			
Budget chapter Ministry of Agriculture of SR	43.0	27.2	70.2
Decree of the MA of SR no. 806/2004-100	5.1	—	5.1
Projects within SOP and PRV	10.8	14.7	25.5
Other sources	93.9	2.8	96.7
Forestry together	152.8	44.7	197.5
Other (MA of SR)			
FRI Zvolen	95.6	1.5	97.1
Lesoprojekt Zvolen	99.1	—	99.1
Forestry Section (FS) of MA SR	11.7	—	11.7
District and County Forest Offices	110.8	4.6	115.4
Other together	317.2	6.1	323.3
Forest sector together	470.0	50.8	520.8

Source: FS MA SR, PPA MP SR

Explanatory notes: FS MA SR – Forestry Section Ministry of Agriculture of SR, PPA MP SR – Agricultural Payment Agency of the Ministry of Agriculture of SR, SOP – Sectoral Operational Programme, PRV – Plan of rural development

In 2005 the Ministry of Agriculture of SR provided financial means from the chapter of budget within the programme 07N01 – Forestry, 07N02 – Formation and conservation of the country and subprogram 05002 – Science and research. They were mainly activities as large-scale protection of forest stands, projects for removal of the consequences of calamity, elaboration of forest management plan, information system of forestry, reimbursement of damages caused by bear, costs of rescue and securing works, capital transfer for the objects of torrent control, aerial forest fires control, administration and protection of national parks and specialized state administration of forestry.

In accordance with of the Decree no. 806/2004-100 of the Ministry of Agriculture of SR on details about providing support in agriculture, food industry and forestry, there were provided financial means from domestic sources for forestry at the total amount of 5.1 million SKK. Of this amount 3.9 million SKK were provided for state sector and 1.2 million SKK for non-state sector. They were used in forestry activities.

Table 9.1.4 – 2 Use of public sources in the forest sector in million SKK

Use	State sector	Non-state sector	Together
Forestry activity	14.0	10.8	24.8
Investments	30.0	14.7	44.7
Other activity	128.0	—	128.0
Together	172.0	25.5	197.5

Source: Forestry Section Ministry of Agriculture of SR, Agricultural Payment Agency of the Ministry of Agriculture of SR

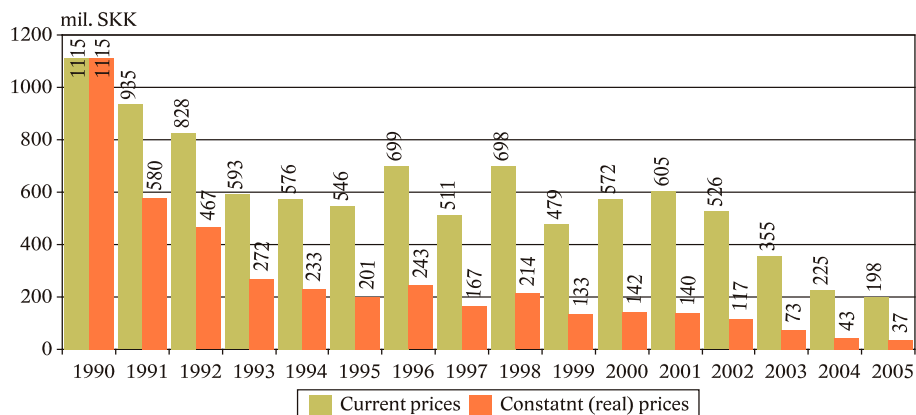


Figure 56 State support to forestry for the performances in public interest in the years 1990–2005 (mil. SKK)

Support from other sources obtained Forestry and Agricultural Estate, state enterprise Ulič, Military Forest and Estates of SR, š. p., Pliešovce, School Forest Enterprise at the Technical University in Zvolen and school forest districts.

There were implemented payments at the amount 25.5 million SKK for the projects within Sector operational programme and Plan of rural development.

An important source of financial means for forestry are public sources from EU structural funds, including EAGGF. These are allocated in forestry in following programmes and measures.

- Sectoral operation programme

*Measure no. 2.1.1* – Investments for improvement and rationalization of silviculture and forest protection, logging, primary wood processing and sale of raw timber and other forest production (profitable investments).

*Measure no. 2.1.2* – Public beneficial investments (non-profitable investments).

- Plan of rural development of the Slovak Republic

*Measure no. 7.1* – Investments for improvement and rationalization of silviculture and forest protection, logging, primary wood processing and sale of raw timber and other forest production (profitable investments).

*Measure no. 7.2* – Public beneficial investments (non-profitable investments).

*Measure no. 8* – Afforestation of agricultural land.

Table 9.1.4 – 3 Overview of approved projects in 2005 from structural funds and from EAGGF

Programme Measure	Sectoral operation programme		Plan of rural development			Together
	2.1.1	2.1.2	7.1	7.2	8	
Number of projects	48	79	—	2	3	132
From EÚ in mil. SKK	111.793	200.402	—	0.242	8.919	321.356
From SR in mil. SKK	42.911	53.383	—	0.217	2.230	98.741
Together mil. SKK	154.704	253.785	—	0.459	11.149	420.097

Source: Agricultural Payment Agency of the Ministry of Agriculture of SR



In 2005 there were approved for forestry in total 132 projects with the requirement for public financial means at the amount 420.097 million SKK, of that 321.356 million SKK from the EU funds and 98.741 million SKK from the state budget of SR.

The effectiveness of the use of support for forestry from public sources is secured at the level of the agencies and organs that provide financial means. In the control of the effectiveness of the use of finances from the budget of the chapter of the Ministry of Agriculture of SR location and specific purpose of their use is observed and it is documented in state final account. The effectiveness of the use of finances provided by Agricultural Payment Agency of the MA SR is carried out every year either by means of monitoring reports for respective approved projects or inspection.

## 9.2. Costs of forestry

Total costs of production, trade and other activities provided by owner's and user's subjects in forestry have increased from the year 2004 to 2005 by 22.8% with regard to an exceptional volume of works in felling and in some silviculture performances. In the sector of non-state forests it was an increase only by 0.5%, in state forest organizations almost 34.8% (tables 1, 3 and 9 in the annexes). From the comparison of the volumes of felling and partially also silviculture activities and total costs of the years 2004 and 2005 as well as actual inflation between these two years there is small real drop of total costs, only in non-state sector (2.1%). An important part of the drop of costs in non-state sector is also unregistered price of the work of forest owners and forest users who provide the management of forests themselves.

*Table 9.2 – 1 Development of the costs in forestry in current prices*

Indicator	1990	1995	2000	2004	2005
Production costs together	4 326	7 419	9 497	10 632	13 061
Material costs including depreciations	1 976	3 226	3 990	4 860	5 139
Depreciations	596	—	813	820	834
Personnel costs	2 056	2 304	3 891	3 678	4 175
Of that: wage costs	1 490	—	2 789	2 640	2 985

*Table 9.2 – 2 Development of costs in forestry in permanent prices of the year 1995*

Indicator	1990	1995	2000	2004	2005
Production costs together	11 775	7 419	6 400	5 542	6 629
Material costs including depreciations	5 379	3 226	2 689	2 533	2 608
Depreciations	1 622	—	548	427	423
Personnel costs	5 596	2 304	2 622	1 917	2 119
Of that: wage costs	4 056	—	1 880	1 376	1 515

*Source: Summary data on forests in SR, 2006, Reports on Forestry in SR, Special questionnaire from forest owners and forest users, Sectoral statistical report*

### 9.2.1. Material costs including depreciations

Increase of material costs including energy and depreciations in 2005 reflects a real increase of the volume of performances, mainly in logging. It reached the value 5.7%. The value of these costs was close the most to European and world level and it reacted quite sensitively to the changes during 2005, mainly in the group of energies and fuels.

Depreciations did not reflect sufficiently the fluctuation in the volume of performances being conditioned by calamity in logging and forest protection. It has increased only by 1.7%. In state forests the increase was 6.5% and in non-state forests there was recorded a drop by 4%. It is assumed that in 2005 there were used sources of depreciations more extensively for investments (more than 90%) that increased by 81.3% in comparison with 2004. In previous period the source of depreciations was used only for 83–85%.

Depreciations form a part of gross added value and at the same also of gross domestic product of newly established production.

### 9.2.2. Personnel costs

Personnel costs as the price of work and the value of natural production factor are in the forestry of SR undervalued the most. Price of work that will be also in future a decisive factor of the intensification of forest production and the increase of work productivity will reach the comparable level with Europe in 20–30 years.

Personnel costs in forestry have increased by 13.5% in 2005 when compared with 2004. In state sector it was the increase by 15.1% mainly due to higher volume of works and real increase of wages. In non-state sector personnel costs have increased by 10.3% (tables 1, 3 and 9 in the Annexes) with slight reduction of the number of employees. Reduction of the number of employees and the growth of the volume of performances were the main factors of the growth of work productivity and increase of average nominal wages (8.6%) as well as real monthly salaries (5.9%) in the forestry of SR. The income of non-state forest owners who actively administer and secure their property and carry out also respective performances themselves is incorporated into the costs of production in non-state forests only by a model calculation. In total forestry economic account is a part of this parameter a part of net revenue from independent activity or net profit from enterprising.

### 9.2.3. Analysis of production costs

In the parts of the chapter 9 – Economics of forestry and in tables 1–10 of the Annex to this report there are presented and evaluated extensive indicators and their time series. They are usually absolute volume and economic parameters, relative proportions, tendencies of development and increments of natural as well as economic indicators in the sector of state and non-state forests.

Objective evaluation of the results of economy must go out from relevant assessment of the quality of basic production factors and financial analysis of the phenomena of economic activities on the basis of the data of analytical accounting. The assessment of economic

activity of state and non-state subjects on the basis of the tools of financial analysis, that are indicator of liquidity, activity, profitability and indebtedness will be reliable when the data of analytical accounting for non-state sector are provided on the level of relevant reporting network. General evaluation of the quality of the economy of the subjects of state and non-state forests may be carried out also through evaluation of the quality of natural production factor (Table 9.2.3 – 1) and intensive indicators of their production activity (Table 9.2.3 – 2).

*Table 9.2.3 – 1 Quality of natural production factor of state and non-state forests in the year 2005*

Indicator	MU	State forest organizations	Non-state subjects	Together
Forest category				
– Commercial	Ths	762/67	546/68	1 308/68
– Protection	ha / %	185/16	143/18	328/17
– Special purpose		184/17	112/14	296/15
Proportion of groups of tree species in commercial forests	%	37.7	45.6	41.00
– Coniferous		62.3	54.4	59.00
– Broadleaved				
Average yield class of groups of tree species in commercial forests	m	28.5	27.8	28.16
– Coniferous		23.8	25.1	24.38
– Broadleaved				
Growing stock per ha of groups of forest tree species in commercial forests	m <sup>3</sup>	264	264	264
– Coniferous		205	203	204
– Broadleaved				
Together	m <sup>3</sup>	227	231	229

*Source: Summary data on forests in SR, 2006, MU - Measurement unit*

It follows from the comparison of the indicators of natural production factor that also in 2005 there were not any more marked differences in the quality of forests managed by the owners of state and non-state forests. The proportions of individual forest categories, average site classes as well as growing stock per ha of individual groups of tree species are comparable. It is similar in the case of other factors as age structure, stocking, damage to forests and rugged terrain where the forest is located. Some comparative advantages

have non-state forests in higher proportion of coniferous tree species in commercial forests.

In the year a slight increase of total costs of silviculture performances per MU was recorded in the sector of state forest organizations, except for protection of young forest stands and cleanings. In non-state sectors unit costs of performances given in table



*Figure 57 Increasing the proportion of natural regeneration is a potential for reducing the costs of silviculture*

9.2.3 – 2 dropped except natural forest regeneration, and silviculture activity per ha of forest, per ha of regenerated plot and m<sup>3</sup> of felling, where the costs slightly increased. In forestry of SR total unit costs dropped for following performances: artificial regeneration, protection of young forest stands and cleanings, in other cases they increased

Unit total costs of the performances in logging in state forest organizations increased in 2005 for all mentioned performances and indicators except timber felling and timber handling. Similarly in non-state sector unit costs increased for all mentioned performances except timber felling and timber transport and the costs connected with the construction and repair of skidding roads and maintenance of forest roads and log depots per m<sup>3</sup> of timber felling (table 9.2.3 – 2).

Table 9.2.3 – 2 Average total costs in SKK for some performances in silviculture and logging

Performance – Activity	Measurement unit	State forest org.		Non-state subjects		Together	
		2004	2005	2004	2005	2004	2005
Forest regeneration in total	ha	32 241	35 130	30 311	27 946	31 520	33 207
Artificial forest regeneration		50 393	51 440	42 130	38 650	47 045	46 209
Natural forest regeneration		4 668	6 202	4 160	5 850	4 506	6 070
Care about forest plantations		4 543	5 814	4 590	3 890	4 558	5 245
Protection of young forest stands		4 340	4 124	4 420	4 300	4 376	4 202
Cleanings		7 746	4 993	5 040	4 240	6 856	4 747
Forest protection	ha of forest	68	100	66	5	67	85
Silviculture	ha of forest	716	941	687	753	704	863
	ha of regenerated area	104 390	136 230	102 905	116 300	103 835	128 329
	m <sup>3</sup> of felling	204	212	181	190	194	197
Felling	m <sup>3</sup>	139	106	170	140	152	136
Skidding		253	213	187	190	226	189
Handling		122	187	57	116	95	169
Transport		188	200	107	90	154	158
Construction and repair of slope roads, maintenance of forest roads and log depots	m <sup>3</sup> of felling	81	116	40	29	65	101
Logging	m <sup>3</sup>	891	965	720	786	821	893
	ha of forest	2 824	1 286	2 728	3 482	2 784	3 617
Silviculture and logging together	m <sup>3</sup> of logging	1 095	1 177	901	976	1 015	1 090
	ha of forest	3 540	5 227	3 415	4 235	3 488	4 480

Source: FRI Zvolen, Summary data on forests in SR, 2006, Statement L–144, Sectoral statistical reports MA SR, Analytical standards of state forest enterprises, Reports on Forestry in SR

### 9.3. Intensity of the use of production factors and economic result

#### 9.3.1. Intensity of the use of production factors

It follows from the comparison of the main production factors use intensity between the year 2004 and 2005 (table 9.3.1 – 1) an increase for natural resource, capital and factor of



workforce (sales and revenues, material costs including depreciations and wages) with evident growth of work productivity.

*Table 9.3.1 – 1 Intensity of the use of production factors in nominal value of current year (SKK. ha<sup>-1</sup>)*

Indicator	Year			Index of growth 2005/2004
	2003	2004	2005	
Sales and revenues	5 267	5 724	6 869	1.200
Of that support for forestry activities	110	10.47	12.46	1.190
Production costs	5 403	5 300	6 511	1.228
Material costs including depreciations	2 269	2 423	2 562	1.057
Depreciations	420	409	416	1.017
Wage costs	1 355	1 316	1 488	1.131

*Source: Sectoral statistical report, Analytical standards of state forest enterprises, FRI Zvolen (Special questionnaire from forest owners and forest users)*

### 9.3.2. Economic results of forest sector

On the basis of the overview of main economic and financial indicators of the SR forest sector for the years 1990, 2003–2005, assumption for the year 2006 and outlook for the year 2007 in division into state forests under the Ministry of Agriculture of SR, state forests under other ministries, non-state forests and together in the Annex 1–10 and illustrative documentation of figures 59 and 60 we can formulate following statement:

- Changes in the inputs and outputs and the structure of forest production as well as the system of direction and organization of forest sector from the year 1990 have been a part and inevitable presupposition of the transformation of forestry into market economy. The forestry of SR has become a competitive part of Europe in the field of market products, public beneficial forest functions and know-how. In future it is necessary to promote intensively the principles of ecological – economic sustainability and increasing the effectiveness of forestry.
- In the establishment of forest natural forest regeneration gained the priority as it has positive effects in the economics of silviculture, forest protection, biodiversity, environment and total revenues of internalities as well as externalities of forest ecosystems.



- Volumes of performances in silviculture after the year 1990 reflect increased level of the utilization of natural given characteristics and their financial demands. In future it is necessary to secure sources for the preservation and improvement of forests on the basis of their socio-economic benefits in the country and for the human being.

*Figure 58 Ecological principles of forest management are increasingly applied in the use of forests*

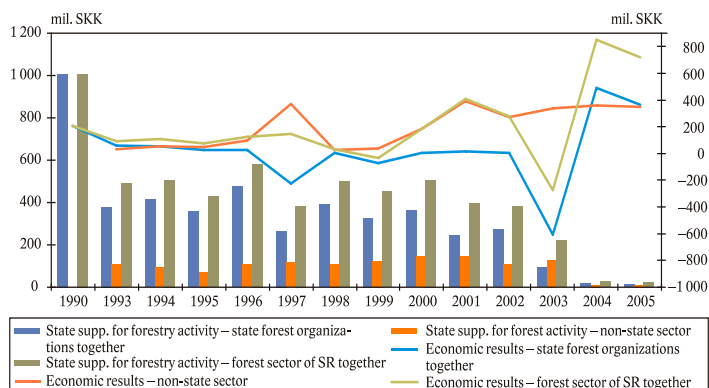


Figure 59 Comparison of the development of state support to forestry activities and the economic result in state forest organizations, non-state sector and forestry of SR for the years 1990–2005

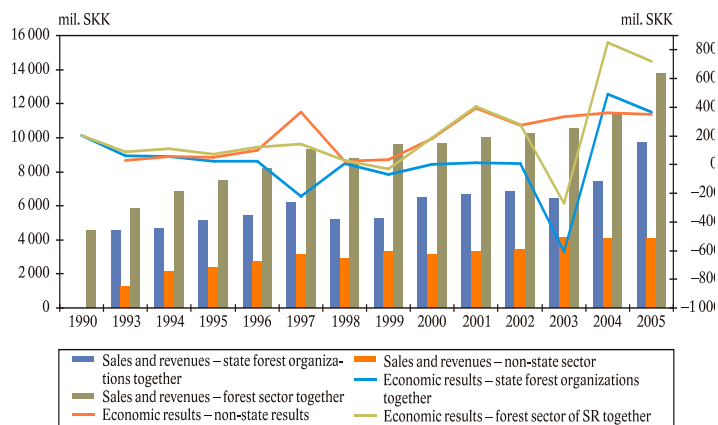


Figure 60 Comparison of the development of sales and revenues and economic result in state forest organizations, non-state sector and forestry of SR together for the years 1990–2005

From the comparison of economic results of state forest organizations in current prices we can observe since 1990 their gradual reducing until 2004 when a turn occurred. State forest enterprise Lesy SR, š. p. affected the most the quality and effectiveness of economy in state forests also in 2005.

In the sector of non-state forests the development of economic result has a tendency of gradual improvement. Since 2003 economic results of non-state forests include also a part of work price of the forest owners and users as well as their family members.

Time series of state support in nominal values (without regarding inflation) shows for the state sector, except the year 1990, permanent drop with the most marked one in 2004 and 2005. The development of the state support in non-state sector has tendency of a slight increase. Real values of state support for forestry activities in the forestry of SR in the years 2000–2005 are after considering inflation since 1990 lower several times.

In the year 2005 sales for timber increased as a substantial source of revenues. It was mainly due to the increase of the volume of sale of timber from wind calamity of the autumn 2004.

Sales and revenues were influenced negatively by lower monetization of timber assortments as a consequence of recession on timber market in Europe and due to the effect of asymmetry of increased domestic wood supplies from calamity felling. A slight growth of work productivity per one employee from the sales and revenues without state support has continued.

### 9.3.3. Economic result

In the evaluation of the results of the management of forest it is relevant to distinguish economic result of forest production and whole production activity. The economic result of forest production is comprised of the difference between the revenues from timber sale, other forest production, forestry services and the costs of silviculture, logging activity and other forest production. Economic result of forestry production activity contains in the sales also goods, products and services of other than forestry activity, including their costs.

Table 9.3.3 – 1 Economic result of the subjects in the forestry of SR re-calculated to measurement unit (SKK)

Forest users	Measurement unit	Forest reproduction			Whole production activity		
		Year					
		2003	2004	2005	2003	2004	2005
State forest organizations	ha of forest	161	1 053	1 489	-494	412	313
	m³ of logging	60	291	268	-154	114	56
Non-state forests	ha of forest	812	689	668	435	443	422
	m³ of logging	232	190	151	124	122	95
Average for all forests	ha of forest	411	905	1147	-136	425	358
	m³ of logging	124	250	226	-41	117	70

Source: FRI Zvolen, Sectoral statistical reports MA SR

Table 9.3.3 – 1 presents that in 2005 the economic result of forest production of state forest organizations has improved significantly when calculated per ha of forest and it has dropped per m<sup>3</sup> of logging. In non-state sector its value has slightly dropped per ha of forest as well as m<sup>3</sup> of logging.

Economic result of whole production activity altogether without inflation considering per ha of forest and per m<sup>3</sup> of logging in state forest organizations as well as in non-state forests has dropped in 2005 in comparison with 2004. In state forests this drop per ha of forest was 78.6% and 88.6% per m<sup>3</sup> of logging, in non-state forests 4.7% and 22.1%, and for the forests of SR together 46.6% and 61.5%.

## 9.4. Total forestry economic account

Currently prepared Total forestry economic account represents a system of five accounts as account of production, account of formation of revenues, account of enterprise profit, account of acquiring of non-financial assets and account of the changes of pure property. Total forestry economic account provides information on the building of estates, their use and on economic processes and relations of the sector within one accounting period. On the basis of the use of the theory of economic circulation it expresses relations of forest sector to other economic systems, as are other enterprises, households, state.

Table 9.4 – 1 Final indicators of total forestry economic account of SR for the year 2005

Indicator	MU	State sector	Non-state sector	Together
Account of production				
1 Usable production (felling)	Ths m³	6 507	3 683	10 190
2 Final production (timber assortments)		6 194	3 093	9 287
3 Average timber monetization	SKK. m <sup>-3</sup>	1 233	1 203	1 223
4 Value of final timber production	Mil. SKK	7 635	3 720	11 355
5 Value of final other production		1 971	220	2 191
6 Value of final game production management		88	120	208
7 Value of final production together		9 694	4 060	13 754
8 Intermediate consumption		4 758	1 570	6 328
9 Gross added value		4 936	2 490	7 426
10 Consumption of fixed capital		474	360	834
11 Net added value		4 462	2 130	6 592
Account of revenues formation				
12 Remuneration to employees	Mil. SKK	2 841	1 334	4 175
13 Other taxes from production		1 019	569	1 588
14 Other subventions for production		142	11	153
15 Net revenue from independent activity		744	238	982
Account of enterprise profit				
16 Interests received	Mil. SKK	7	10	17
17 Rent received		144	30	174
18 Interests paid		3	5	8
19 Rent paid		161	30	191
20 Net profit from enterprising		731	243	974

Source: Summary data on the forests in SR, 2006, Sectoral Statistical reports of MA SR

Main indicators of the account of production, formation of revenues and enterprise profit in current prices (the value of final production, gross added value, net added value, net revenue and net profit) show for the period since 1998, except some small common fluctuation in the year 2001 and with some individual fluctuations in some years, slight up to significant increase (Table 9.4 – 2).



Table 9.4 – 2 Development of the indicators of total forestry economic account of SR in current prices (account of current transactions)

Indicator	MU	Year								Index	
		1998	1999	2000	2001	2002	2003	2004	2005	2005/2004	
Production account											
1 Usable production (felling)	Ths m³	5 533	5 793	6 218	6 185	6 260	6 652	7 268	10 190	1 402	
2 Final production (timber assortments)		5 094	5 211	5 791	5 720	5 607	6 257	7 198	9 287	1 290	
3 Average timber monetization	SKK.m³	1 192	1 284	1 227	1 341	1 375	1 335	1 315	1 223	0 930	
4 Value of final timber production		6 072	6 767	7 104	7 567	7 748	8 355	9 468	11 355	1 199	
5 Value of final other production		1 981	2 198	1 833	1 893	1 849	1 694	1 649	2 191	1 329	
6 Value of final production of game management		160	165	163	179	190	184	202	208	1 030	
7 Value of final production together	Mil. SKK	8 213	9 130	9 100	9 639	9 787	10 233	11 319	13 754	1 215	
8 Intermediate consumption		3 809	4 190	3 989	4 210	4 471	4 747	4 669	6 328	1 355	
9 Gross added value		4 404	4 940	5 111	5 429	5 316	5 486	6 650	7 426	1 117	
10 Consumption of fixed capital		839	870	813	764	791	842	820	834	1 017	
11 Net added value		3 565	4 070	4 298	4 665	4 525	4 644	5 830	6 592	1 131	
Account of revenues formation											
12 Remuneration to employees		3 537	3 647	3 891	4 034	4 078	3 831	3 678	4 175	1 135	
13 Other taxes from production	Mil.	215	220	182	187	182	432	1 589	1 588	0 999	
14 Other subventions for production	SKK	500	452	507	517	440	322	165	153	0 927	
15 Net revenue from independent activity		313	655	732	961	705	703	728	982	1 349	
Account of enterprise profit											
16 Interests received		25	29	20	14	7	12	13	17	1 308	
17 Rent received		135	145	130	80	51	117	144	174	1 208	
18 Interests paid	Mil. SKK	65	75	71	29	18	47	14	8	0 571	
19 Rent paid		110	120	126	124	120	136	115	191	1 661	
20 Net profit from enterprising		298	634	685	902	625	649	756	974	1 288	

Source: Summary data on the forests in SR, 2006, Sectoral statistical reports of MA SR

## 9.5. Economic tools

### 9.5.1. Prices of basic production factors

For official valuation of forest property, including natural production factor and the products of production process, there is currently used the methodology of regulated and market prices. The methodology of regulated prices is being applied in accordance with the Regulation of the Ministry of Justice of SR no. 492/2004 of the Digest on determination of general value of the property and pursuant to the new act on forests (no. 326/2005) for the determination of the value of the effect of non-production forest functions. Regulated (official market) value of forest property and public beneficial forest benefits are applied mainly in relation to the state and state organs (taxes, payments) as well as an orientation level of market price accepting formal factors of demand and supply. Market prices of the products of forest production and forest are presented and discussed in the parts 8.1 and 9.1 of this report.

### 9.5.2. Taxes

*Table 9.5.2 – 1 Overview of the amount of respective taxes that forest sector of SR pays to the budget of the state and municipalities divided into state and non-state sector (million SKK)*

Kind of tax	Year	State forest organizations	Non-state subjects	Together
Value added tax (VAT) (Difference between paid and returned)	1998	580	350	930
	2000	551	340	891
	2003	596	360	956
	2004	582	350	932
	2005	636	360	996
Real estate tax	1998	80	30	110
	2000	73	26	99
	2003	74	27	101
	2004	76	28	104
	2005	98	30	128
Road tax	1998	25	10	35
	2000	32	8	40
	2003	29	7	36
	2004	47	7	54
	2005	28	8	36
Income tax*	1998	133	45	178
	2000	149	38	187
	2003**	258	174	432
	2004	329	166	495
	2005	257	171	428
Together	1998	818	435	1 253
	2000	805	412	1 217
	2003	957	568	1 525
	2004	1 034	552	1 585
	2005	1 019	569	1 588

*Source: FRI Zvolen (Special questionnaire from forest owners and forest users)*

*Explanatory note: \*expert estimate; \*\*derived from paid wages and gross profit*

The highest proportion in paid taxes has also in 2005 VAT (62.7%). Table 9.5.2 – 1 presents the amount of the difference between paid and returned amounts of VAT. Income tax (gross income), including tax on income from dependent activity, dropped in 2005 in comparison with 2004. It was the consequence of more accurate calculation, applying a new act on income tax and reducing the number of employees in state forests. This drop was recorded in the sector of state forest organizations where about 51% of the employees in whole forest sector of SR are employed. An increase was recorded in non-state sector, where in the category of communal and private forests the basis of the tax comprises also the part of work price of the owners of forest lands. Amount of taxes of entrepreneurs in the forestry of SR and their employees has been given in registered taxes only partially.

Real estate tax has increased in 2005 by 23% in comparison with the previous year. Mainly state forests contributed to this increase by 28.9%. This tax is connected with annual excluding and including those groups of forest lands of commercial forests into tax duty where regeneration or incidental felling was executed. Another factor is including forest stands that reached the age of first thinning. The increase of the above mentioned tax might be attributed also to the tax on constructions and construction lands. Its proportion in the taxes paid reached 8.1%.

In total amount of annually paid taxes into the budgets of the state and municipalities the proportion of state forest organizations was 64.2% and the proportion of non-state forests subjects was 35.8% in 2005.

### 9.5.3. Credits

The approach of entrepreneurial subjects, first of all in state sector, to the use of this source of financing own needs is quite reluctant. Finances can be used for coverage of deficit in case of short-term financial needs, late payments for timber or purchase of necessary items of inter-consumption. The credits were used mainly by non-state sector, especially for the purchase of machinery and construction of roads.

*Table 9.5.3–1 Situation in the use of credits in state and non-state forest sector of SR (million SKK)*

Kind of credit	Forest sector						Together		
	State			Non-state*					
	2003	2004	2005	2003	2004	2005	2003	2004	2005
Credit from past period (Not paid yet)	35	40	36	15	20	20	50	60	56
Received bank credits in the given year	117	0	56	50	60	60	167	60	116
<b>Together</b>	<b>152</b>	<b>40</b>	<b>92</b>	<b>65</b>	<b>80</b>	<b>80</b>	<b>217</b>	<b>120</b>	<b>172</b>
Amount of property security	29	28	29	120	150	150	149	178	179
Interest rate	8.4	7.5	7.0	8.1	7.3	7.0	8.3	7.4	7.0

*Source: FRI Zvolen (Special questionnaire from forest owners and forest users).*

*Explanatory note: \*expert estimate*

### 9.5.4. Payments for excluding of forest lands

The purpose of these payments is to protect natural forest property, i.e. to preserve fertility of forest soil, sustainability of forest ecosystems and effects of the benefits of non-production (public beneficial) forest functions. The tariffs of payments, pursuant to § 9 of the new act on forests, represent a reimbursement of the loss of non-production forest functions. Official value of non-production (public beneficial) forest functions was derived for the conditions of individual management group of forest types in thousand SKK per 1 ha of forest, for the period of average rotation in given management group of forest types. The tariffs of the effects of non-production forest functions are included into the Annex no. 1 to the new act on forests.



*Figure 61 The amount of reimbursement for the loss of non-production forest functions reached about 30 million SKK in 2005*

### 9.5.5. Penalties and sanctions for non-observance of the provisions of forestry legislation

For the non-observance of some provisions of the Act no. 326/2005 of the Digest on forests the organs of state administration of forestry can impose penalties. The amount of these penalties concerns about 300 subjects from the state and non-state forest sector per year. The amount of penalties reached 2.158 million SKK in the year 2005. The amount of paid penalties was 0.622 million SKK, it means 28.8% of the total amount of imposed penalties.

### 9.5.6. Reimbursement of damage to forest property

For the reimbursement of damage caused to forest property there are applied general legal norms on damage reimbursement and some provisions of the act on forests. Anthropogenic agents, mainly air pollutants, cause the highest damage in forests.

In last years the negative effect of air pollutants on forest stands has lowered markedly, mainly due to the improvement of emission situation as the result of reduction of industrial activity. Current state of air pollutants effects cause damage to forest ecosystems that is estimated to reach about 500 million SKK annually. The process of reimbursement of damages is very lengthy due to various reasons.

Real amount of reimbursed damage per year is only about 20% of the damage determined in the opinions of experts. Therefore it is proposed, in addition to damage reimbursement, to promote the rule of using appropriate part of penalties for air pollution for the implementation of recovery measures in forests.



### 9.5.7. Reimbursement for the restriction of ownership's rights

The highest proportion in the restriction on the applying ownership's rights in relation to forests have mainly following acts: Act no. 543/2002 of the Digest on nature and landscape protection, Act no. 326/2005 of the Digest on forests, construction Act no. 50/1976 of the Coll. in the version of later regulations, the Act no. 23/1962 of the Coll. on hunting in the version of later regulations and the Act no. 70/1998 of the Digest on energy industry.

The value of property loss due to implementation of the forest act is about 380 million SKK per year, while in state sector it is 170 million SKK and in non-state sector 210 million SKK. The value of property loss due to applying the act on nature and landscape protection reached according to the quantification performed in 2001 by Forest Research Institute Zvolen 920 million SKK. The quantification was worked out on the basis of the data from the Ministry of Environment of SR. In non-state sector it was 540 million SKK and in state sector 380 million SKK.

## 9.6. Investment development

### 9.6.1. Volume of works and of deliveries of investment construction

Volume of works and deliveries of investment construction reached 932 million SKK in the forest sector of SR in 2005, what is an increase by 418 million SKK in comparison with 2004. Of the total volume construction investments were 403 million SKK, machines and technologies 462 million SKK and other investments 67 million SKK.

Table 9.6.1 – 1 Comparison of the volume of investments in the year 2004 and 2005

Kind of investment	Forest sector of SR		Of that					
			State forest organizations		State organizations of the Ministry of Agriculture of SR		Non-state forests of SR	
	2004	2005	2004	2005	2004	2005	2004	2005
Building works	220	403	170	363	130	243	50	40
Machines and equipment	275	462	195	387	174	325	80	75
Other	19	67	7	57	7	47	12	10
Together	514	932	372	807	311	615	142	125

Source: Statistical report

In 2005 the situation has improved what concerns investments mainly in state forest organizations. Total volume of investments reached 807 million SKK what was an increase by 435 million SKK in comparison with 2004. In the state forest enterprise Lesy SR, š. p. total volume of investments reached 551 million SKK what was an increase by 281 million SKK when compared with 2004.

*Table 9.6.1 – 2 Allocation of construction investments in state organizations under the Ministry of Agriculture of SR according to respective objects*

Building works	Mil. SKK
Forest roads	156
Log depots	22
Torrent control	30
Buildings, objects and constructions	9
Nursery activities	1
Other building works	25
Together	243

*Source: Statistical report*

## 9.6.2. Investments for machines and equipment

Investments for machinery and technologies in forest sector reached 462 million SKK in the year 2005. It was an increase by 187 million SKK in comparison with 2004. In non-state forests it was 75 million SKK, what was by 5 million SKK less than in 2004.

Breakdown of investments into machinery and equipments in state forest enterprises under the Ministry of Agriculture of SR that reached in 2005 the value 325 million SKK are presented in table 9.6.2 – 1.



*Figure 62 Investments at the amount 462 million SKK were provided for machines and equipment in 2005*

*Table 9.6.2 – 1 Structure of investments for machinery and equipments in state forest enterprises under the Ministry of Agriculture of SR*

Kind of investment	Mil SKK
Machines and equipment for timber felling	43
Machines and equipment for timber skidding	23
Machines and equipment for timber transport	29
Machines and equipment for timber handling	58
Machines and equipment for the production of forest chips	54
Machines and equipment for silviculture and forest nurseries	1
Personal and technological transportation	67
Computer systems	36
Computer programmes	14
Together	325

*Source: Reports on the results of the analysis of economic activity in state forest enterprises under the Ministry of Agriculture of SR for the year 2005*

## 9.7. Workforce in forest sector

### 9.7.1. Workforce and motivation for work

Average number of the employees in economic sphere of the forest sector has been decreasing. In 2005 it reached 82% of the previous year's number. In last years more and more is introduced execution of works on contract what results in reducing the number of own employees in state forest sector. State enterprise Lesy SR, š. p. enterprise reduced the number of own employees with permanent working contract by 1 044 employees. At the same time there are created new entrepreneurial subjects and employees for them are former technical-economic employees and workers of state forest organizations. In the registry of the organizations of the Statistical Office of SR there are registered 6 684 subjects in forestry, wood logging and related services. Of these subjects there are more than 3 800 licence holders.

Table 9.7.1 – 1 Number of employees in forest sector

Number of employees	1990	2000	2004	2005
Forest sector of SR	36 316	22 245	14 868	13 703
Of that: state forest organizations	36 316	15 675	8 288	7 019
– Non-state forests in SR*	—	6 570	6 580	6 684

Source: Statistical Office of SR, Special questionnaire of the Ministry of Agriculture of SR

Explanatory note: \*derived from the volumes of production, productivity of work and costs of performed activities

Table 9.7.1 – 2 Number of employees in state forest enterprise Lesy SR š. p.

Indicator	2000	2004	2005	Difference 2004–2005
Technical – economic employees	3 739	2 993	2 765	-228
Workers	9 318	2 717	1 901	-816

Source: Lesy SR, š. p.

The number of women employees has decreased as a result of the drop in the number of seasonal women workers and reduction of the volume of works in silviculture and forest protection in last years. The ratio of employment rate of men and women in forest sector was 4 : 1. There were employed 80.4% of men and 19.6% of women in state forest organizations in 2005.



In comparison with previous year average monthly salary has increased by 8.6%. It was 15 543 SKK what was 90% of the average wage in the national economy of SR.

Figure 63 A specific character of works in forest causes high rate of work injuries and diseases in forestry

### 9.7.2. Incapability to work and work injuries of employees

Forestry belongs to the sectors with high rate of work injury and occupational diseases. While in 2005 the total number of work incapability due to sickness and injuries per 100 insured workers was 38.1, the average value for all economic sector was 31.0. This is caused by the character of works in forests, climatic conditions at workplaces, terrain and machinery as well. Diseases of movement apparatus and breathing apparatus account for the highest proportion in total work incapability. In forest sector prevail diseases due to vibration of power saws, very high noise of machines, Lyme disease.

The highest risk of work injuries is for the workers in harvesting, timber skidding and transport.

The development of work injuries in 2005 reflects restructuring changes in the forest sector – shift of the implementation of production forestry activities into external environment. This situation reflects in the lowering the number of work injuries in the ratio per 100 own employees and in increased occurrence of injuries among contractors and self-producers.

Similarly to the rate of work injuries also for the number of new occupational diseases of the employees in state forest sector has dropped markedly. Lyme disease is becoming a dominant occupational disease.

Keeping statistical data on work injuries and work incapability in forestry is complicated especially in non-state sector. Work injuries of land partnerships members and co-owners of private forests are registered as non-work injuries despite the fact they happened during the management of forests.

*Table 9.7.2 – 1 Overview of the number of newly detected occupational diseases and work injuries in state forest organizations*

Indicator / Year	2000	2003	2004	2005
Number of newly detected occupational diseases in state forest organizations	46	62	54	66
Number of work injuries in state forest organizations of that:	560	335	215	268
Heavy		7	3	0
Fatal		4	1	0
Number of work injuries per 100 employees	3.49	2.94	1.97	1.95

*Source: Statistical Office of SR, state forest organizations*







## 10. INFORMATICS, RESEARCH, EDUCATION AND PUBLIC RELATIONS

### 10.1. Informatics

Until the year 2005, the Forestry Information System (FIS) of the Slovak Republic was ensured based on the approved concept of the sectoral information system, as well as the concept of computerization in the sector of the Ministry of Agriculture of SR. It has been developed as a dynamic and partially closed system connected with accounting information system, Forest Management Record (FMR), social, economic and scientific - technical information. The goal of the system is to monitor and present all related forestry fields. Building and developing the FIS serve securing the information, communication and managerial aspects. FIS provides information with a different classification and aggregation level for a users sector on following levels of management: top (including international institutions), medium, basic and professional level.

The Forestry Information Database that has a key position within FIS, collects, processes, evaluates and archives data on forests in the Slovak Republic and on management in them.

The current FIS consists of subsystems:

- The forest condition and development subsystem ensures permanent monitoring and assessment of data on condition and development of forests in Slovakia based on forest management plan databases, specialized surveys and forest condition monitoring.
- The FMR subsystem is based on lawful duty for managers of forests to provide data on implemented measures according to the Act No. 326/2005 of Coll on forests.
- The subsystem of owners 'and users' relations to forests was established for the needs of building the register of forest land owners and users.
- The subsystem of sectoral statistics consists of state statistical surveys organized and implemented by the Ministry of Agriculture of the Slovak Republic based on the Act No. 540/2001 of Coll. on the state statistics in wording of the Act. No. 215/2004 of Coll. for the needs of sector's management and guidance of forestry.
- The market subsystem (so called forestry market information system) provides up-to-date information on timber prices and other forests products within the inland and foreign market.
- The geographical subsystem has an interdisciplinary character and represents an important part of rationalization of the FIS. It enables complex analyses of information and results presentation.

The component of the FIS is an information system for forest users. It provides information for forest land owners and users, specialized forest managers, workers of state administration, developers of the forest management plans and further entities using data of the forest management plans and forest management recording.

Information on forest and forestry can be classified according to their use into:

- National (local administration authorities, professional organizations, forest enterprises and other forest subjects),

- International on different levels:
  - European Union (European Commission (EC) – DG Eurostat, DG Agri, DG Environment),
  - Pan-European level (MCPFE),
  - Global/subregional (UN Economic Commission for Europe (UNECE), United Nations (UN), Food and Agriculture Organization (FAO) and others).

International and national information on the EU level are mutually interconnected.

In the past, the European Forest Information and Communication System (EFICS) was established to ensure the information needs on the regional level. At present, the European Forest Information and Communication Platform (EFICP) have been developed instead of it.



Figure 64 FAO and UNECE in co-operation with representatives of the member countries provide information on forestry at a global and regional level

In 2005, the Food and Agriculture Organization of the United Nations in co-operation with national correspondents from 172 countries developed the Global Forest Resources Assessment (GFRA) 2005 for the reason of securing information on forestry and forest resources development on a global level.

The data on timber and wood products with little modifications from national database information are provided annually to FAO/UNECE and EUROSTAT.

Based on the Council Regulation (EC) No. 1698/2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) there is expected a monitoring and assessment of results of rural development policy according to the common indicators resulting from the current information sources: Eurostat statistical activities (forest economic accounts, energy statistics), forest resources assessment and reports for MCPFE.

For assessment of the forest health condition development in Europe have been annually provided the data on forest health condition in Slovakia for the Co-ordination Programme Centre of ICP Forests in Hamburg. The basis is data from approximately 6 000 permanent monitoring plots (PMP) of the European transnational network of ICP Forests programmes and 860 PMPs of Pan-European Intensive Monitoring Programme.

## 10.2. Research

In 2005, within the forest research the Forest Research Institute Zvolen (FRI) with the research stations in Liptovský Hrádok, Gabčíkovo, Banská Štiavnica and Košice, as well as Research Station and Museum of the State Forests of the Tatra National Park (RSM TANAP) operated in the sector of the Ministry of Agriculture of SR. In addition, the Faculty of Forestry of the Technical University in Zvolen (FF TU) and the Institute of Forest Ecology of the Slovak Academy of Sciences Zvolen (IFE SAS) work in the forestry research outside the agriculture sector.

Table 10.2 – 1 Number of scientific and research projects and tasks solved in 2005

Organization	Number of projects						
	International			Inland			In cooperation
	5 <sup>th</sup> FP	6 <sup>th</sup> FP	Other	VEGA	APVT	Other	
FRI	—	1	11	—	14	9	8
RSM TANAP	1	3	3	2	2	11	2
FFTU	1	3	—	21	2	7	6
IFE SAS	—	—	6	10	3	2	5

Source: Special questionnaire of the Ministry of Agriculture of the Slovak Republic

Explanatory note: APVT – Agency for support of science and technics

In the year 2005, the research institutions solved also the projects aimed at elimination of impacts caused by the windstorm from 19<sup>th</sup> November 2004.

There is still developing the international co-operation on bilateral and direct collaboration on European level, for example within the COST projects. From dissemination of scientific knowledge point of view, there is important publication activity of researchers in domestic and foreign journals, as well as institutions' editing activity.

Table 10.2 – 2 Publication activity in particular institutions in 2005

Organization	Number of published works			Opinions, viewpoints, expertises, studies
	Totally	of them scientific	of them professional and popular	
FRI	265	162	103	153
RSM TANAP	54	4	50	41
FFTU	269	149	120	144
IFE SAS	188	128	60	16

Source: Special questionnaire of the Ministry of Agriculture of the Slovak Republic

Table 10.2 – 3 Survey of published titles

Organization	Scientific and professional journals
FRI	Lesnícky časopis – Forestry Journal, Folia venatoria
RSM TANAP	Studies on Tatra National Park Tatras
FFTU	Acta Facultatis Forestalis
IFE SAS	Folia oecologica, Tichodroma

Source: Special questionnaire of the Ministry of Agriculture of the Slovak Republic



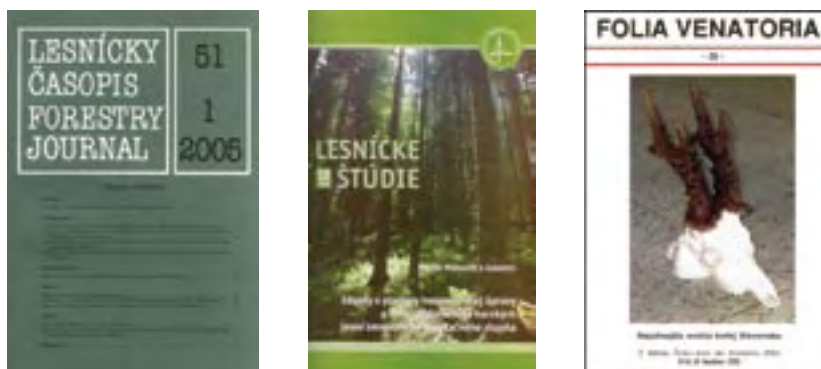


Figure 65 Publication activity is of a great importance for dissemination of new scientific knowledge

Representatives of the mentioned institutions have presented the achieved results during the professional and scientific undertakings organized in Slovakia and in foreign countries. In 2005, the organizations held 48 scientific and professional events (conferences, seminars, and workshops). Some of them have a credit of traditional undertaking on the topical issues of forestry research (e.g. “Nursery practice” seminar in Liptovský Hrádok, “Forest protection” seminar in Banská Štiavnica, Financing Forests – Wood at the Technical University in Zvolen, Tree species in public greenery – organizer Forest Ecology Institute of the Slovak Academy of Sciences, etc.).

### 10.3. Education in forestry



Figure 66 More than 170 new forest engineers graduate annually from the Forestry Faculty of the Technical University in Zvolen

Education of new generation in forestry is being ensured by the Faculty of Forestry of the Technical University in Zvolen, three Secondary Forestry Schools (SFS) Banská Štiavnica, Liptovský Hrádok, Prešov, and five Forestry Vocational Schools (FVS) Banská Štiavnica, Bijacovce, Modra Harmonia, Sigord and Tvrdošín.

Since the academic year 2005/2006, 193 students in full-time and 50 in part-time form have studied at the Forestry Faculty of the Technical University in Zvolen within the framework of a new three-degree study

form BSc. degree study programme (bachelor) – MSc. degree study programme (engineer) – PhD. degree study programme (doctor).

Secondary forestry schools and vocational schools make more attractive the study by launching new branches of study, as well as within the framework of professional practice by cooperation with foreign countries (Germany, Poland, Ukraine).

Table 10.3 – 1 Breakdown of study at the Faculty of Forestry of the Technical University in Zvolen during the year 2004/2005

University study (engineers)			Doctoral study		
Branch of study	Full-time study	Part-time study	Branch of study	Full-time study	Part-time study
	Students number/ Graduates number			Students number/ Graduates number	
Forestry	356/97	121/19	Ecology	3	9
			Silviculture	3	3/1
			Forest Management Planning	4	9/1
Management and financing of forest enterprises	69/21	—	Amelioration	2	3
			Technology and Mechanization of Agricultural and Forest Production	4	10
Forest ecology	46/25	—	Forest Phytology	4/1	5
			Plant Protection	2	6/1
Applied zoology and game management	65/10	—	Sector's and Cross-sectional Economics	1/1	17
Together	536/153	121/19		23/2	62/3

Source: Special questionnaire of the Ministry of Agriculture of the Slovak Republic

Table 10.3 – 2 Breakdown of study within the framework of secondary forestry schools and forestry vocational schools

Schools	Branch of study	Number of students/ school leavers
SFS	Forestry (full secondary professional education)	785 / 184
	Forestry and forest management (advanced professional education)	78 / 27
	Rural tourism (advanced professional education)	31 / 7
<b>SFS together</b>		<b>894 / 218</b>
FVS	Artistic and handicraft wood processing	26 / 8
	Operator for forest technology	141 / 34
	Mechanic repairman – forest machines and equipment	113 / 42
	Mechanic for forest production	272 / 105
	Forest management (advanced professional education)	189 / 91
	Forest production	101 / 14
	Entrepreneur in agriculture – tourism in rural areas	61 / 0
	Cabinet-maker	16 / 0
	Mechanization of agriculture and forest management (advanced professional education)	62 / 33
	Forest and landscape professional	9 / 0
<b>FVS Together</b>		<b>990 / 327</b>

Source: Special questionnaire of the Ministry of Agriculture of the Slovak Republic

The important task within further education has fulfilled the Institute for Education and Training of Forestry and Water Management Staff of the Slovak Republic (IETFWMS SR) by ensuring the extension and expertise activity for owners of forest lands.

Table 10.3 – 3 Breakdown of educational activities in forestry provided by IETFWMS SR

Educational activities	Number of activities	Number of participants
Professional education of technical and managerial staff	23	588
Education of workers professions	47	339
Forest land owners education programme	6	177
Language courses	12	134
<b>Together</b>	<b>88</b>	<b>1 238</b>

Source: Special questionnaire of the Ministry of Agriculture of the Slovak Republic

In 2004, the Centre of Continual Education (CCE) was established as a general workplace of the Technical University in Zvolen aimed at development and providing further education in compliance with professional orientation of the faculties at the Technical University in Zvolen. The Centre prepares students also for acquiring language certificates and IT skills in addition to accredited courses by the Ministry of Education of the Slovak Republic.

Table 10.3 – 4 Breakdown of courses organized by the Centre of Continual Education at the Technical University in Zvolen

Formulation of agriculture land afforestation projects
Formulation of projects in forestry observing the programme documents in Slovakia (Rural Development Plan and Sector Operational Programme)
Cultivation of broadleaved forests considering the value increment production (close to nature cultivation of broadleaved stands)
Selection system and selection forests
Integrated logging and transportation technology in forestry – technique and technology in changed social and economic conditions of expanded Europe
Influence of stand structure and cultivation measures on reduction of soil erosion risk
Agro-environmental measures in agriculture
Planning of enterprise development
Financial and organizational enterprise stabilization
Legislative and economic conditions for entrepreneurship
Utilization of information and communication technology (ICT) in practice
Utilization of ICT on level of European user standards
Elements of work of art and their composition in relation to structure of work of art
Sustainable utilization of biomass
Diversification of rural activities

#### 10.4. Public relations

Systematic work with broad public through the mediation of media, advertising and educational materials and various undertakings puts forward a positive relation of residents to forest, forestry and foresters. It educates especially young generation for a sound relation to the environment.

In 2005 there were organized further years of undertakings “Deň stromu” (Tree’s Day), “Dni svätého Huberta” (Days of St. Hubert), “Levické poľovnícke dni” (Hunting Days in Levice), “Lesnícky deň” (Forestry Day), “Stromček pod stromček” (Tree for Christmas), “Zelený objektív” (Green Objective), “Deň zážitkov v lese” (Day of Experiences in Forest), “Lesy deťom” (Forests for Children), “Lesnícke detské hry” (Forestry Children Games),

“Lignumexpo” and many others. The importance of these events has currently increased. Regularity and professional importance of these events belonging between the important Slovak and regional cultural and social undertakings have achieved many admirers.

During the whole year foresters from the State Forests of the Tatra National Park, the State Forests of the Slovak Republic, and some municipal forests have dedicated to work with students of the elementary and secondary schools in the regions through the activities of forest pedagogy. Forest information offices and educational trails serve broad public, e.g.: Forest educational trail (Branch Enterprise Námestovo), Educational trail Danube's floodplains (Branch Enterprise Palárikovo), Educational trail Abandoned Castle (Pustý hrad) (Forests of the Zvolen Town, Forestry Faculty of the Technical University in Zvolen).

The most attractive for public are museums. In 2005, the Museum of the Tatra National park (TANAP) visited almost 35 thousand visitors, the Forestry Open Air Museum in Vydrovo approximately 24 thousand visitors, the Exhibition of Tatra's Nature more than 5 800 visitors. From smaller museums can be mentioned for example the History of Forestry in Orava with almost 2 000 visitors. Forestry and Wood Technology Museum in Zvolen has organized 48 cultural and educational undertakings – lectures, discussions, lessons,



*Figure 67 Each year more visitors come to the Forestry Open Air Museum in Čierny Balog*

competitions, guiding service through the town, film shows, evenings with literature and music. These undertakings were participated by 1 711 visitors. Museum has prepared also 20 exhibitions and 9 exhibition blocs, which were presented outside the premises of the museum (Klenovec – Forestry Day, Banská Bystrica's Square SNP and Open Air Museum in Pribylina on the occasion of the International Museums Day, Ostrá Lúka – Spring of Adela Ostrolúcka, Čierny Balog – Tree's Day, Hrušov – Hrušov's Parade, Nitra – Forest 2005, Wood 2005, Nitra – World Food Day, Tatranská Lomnica – travelling photo exhibition „Windstorm in the Tatra Mts. by Heart and Wisdom”. The Museum in St. Anton has organized 30 cultural and educational events including Days of St. Hubert. In addition, the Museum has assisted as a co-organizer in presentations for children: Forestry Day – Kokava nad Rimavicou, Spring below Sitno, Hypericum Competition, Young Friends of Forest – Počúvadlo, Children for Nature – Teplý Vrch.

Within the promotion of forestry there were organized various discussions, excursions and competitions for broad public (e.g. Forests and People, the Tatra Mts. after Windstorm, The Best Forester). The goal of rising public awareness and promotion of forestry has been fulfilled by presentation of forestry at the expositions of inland exhibitions, issuing various information materials, worksheets for students and DVD Tatra Mts. Forest at the Crossroad. For journalists and the members of the National Council of the Slovak Republic have been prepared the promotion undertakings on a level of parliament.





## 11. OTHER SECTORS AND ACTIVITIES RELATED TO FORESTRY

### 11.1. Nature and landscape protection

Forest ecosystems represent an extremely valuable part of specially protected territories (SPT) and just here an overlap of interests between forestry and nature and landscape protection occurs most frequently. A complex nature and landscape protection is carried out pursuant to the Act no. 543/2002 of the Digest on nature and landscape protection. Five degrees of nature protection are determined within territory protection. Protected territories can be divided into 4 zones on the basis of biotope condition: A zone with the 5<sup>th</sup> degree of protection, B zone – 4<sup>th</sup> degree of protection, C zone – 3<sup>rd</sup> degree of protection and D zone – 2<sup>nd</sup> degree of protection.

Table 11.1 – 1 Area of special protection areas according to the level of protection (State to 31 December 2005)

Degree of protection	Protected territories	Area (ha)	Percentage of the area of SR	Forest percentage
2 <sup>nd</sup>	CHKO, zone "D" CHKO Horná Orava: 491 260 ha, OP NP, zone "D" PIENAP: 267 065 ha	758 325	15.46	66.1
3 <sup>rd</sup>	NP, zone "C" PIENAP: 247 654 ha, OP PR: 86 ha, OP NPR: 875 ha, OP PP: 159 ha, CHA: 601 ha, OP CHA: 2 419 ha Zone "C" CHKO Horná Orava: 14 793 ha	266 287	5.43	91.1
4 <sup>th</sup>	CHA: 4 600 ha, OP PR: 158 ha, PP: 884 ha, PR: 3 376 ha, OP NPR: 1 935 ha, OP PP: 48 ha, OP NPP 27 ha, Zone "B" PIENAP: 837 ha, NPP: 58 ha, NPR: 2 319 ha, Zone "B" CHKO Horná Orava: 3 356 ha	17 598	0.36	64.7
5 <sup>th</sup>	PR and private PR: 9 473 ha, NPR: 81 393 ha, PP: 660 ha, NPP: 1 ha, Zone "A" PIENAP: 277 ha, Zone "A" CHKO Horná Orava: 1 263 ha	93 067	1.90	74.0

Source: Ministry of the Environment of SR

Explanatory notes: CHKO – protected landscape area, NP – national park, CHA – protected range, (N)PR – (national) nature reserve, (N)PP – (national) nature landmark

Total area of SPT was 1 135 277 ha to 31 December 2005, including the protection zone, which constitutes 23.2% of the SR territory. Total forest cover in the 2<sup>nd</sup>–5<sup>th</sup> degree of protection is 72.6% and the importance of forest ecosystems in those territories is clear. At present the whole system of protection areas consists of 9 national parks (NP), 14 protected landscape areas (CHKO) and 701 small-area protected areas (MCHÚ), that include national nature reserves (NPR), nature reserves (PR), national nature landmarks (NPP), nature landmarks (PP) and protected ranges (CHA).



Figure 68 Forest percentage is more than 90 in the national parks

Table 11.1 – 2 Overview of the national parks in Slovakia

National park (NP)	Area (ha)	Of that forest land (ha)	Area of protection zone (ha)	Of that forest land (ha)
Tatranský národný park (TANAP)	73 800	69 829	30 703	6 446
Pieninský národný park (PIENAP)	3 750	1 377	22 444	10 492
NP Nízke Tatry (NAPANT)	72 842	64 481	110 162	70 049
NP Slovenský raj	19 763	17 571	13 011	7 637
NP Malá Fatra	22 630	18 711	23 262	9 388
NP Muránska planina	20 318	17 507	21 698	14 401
NP Poloniny	29 805	26 996	10 973	5 671
NP Veľká Fatra	40 371	35 524	26 133	17 182
NP Slovenský kras	34 611	27 800	11 742	5 500
Together	317 890	279 796	270 128	146 766

Source: Ministry of the Environment of SR

Table 11.1 – 3 Overview of protected landscape areas in Slovakia

Protected landscape area (CHKO)	Area (ha)	Of that area of forest land (ha)
CHKO Vihorlat	17 485	16 648
CHKO Malé Karpaty	64 610	57 608
CHKO Východné Karpaty	25 307	19 509
CHKO Horná Orava	58 738	33 317
CHKO Biele Karpaty	44 568	29 978
CHKO Štiavnické vrchy	77 630	56 275
CHKO Poľana	20 360	17 102
CHKO Kysuce	65 462	46 600
CHKO Ponitrie	37 665	34 867
CHKO Záhorie	27 522	11 825
CHKO Strážovské vrchy	30 979	24 104
CHKO Cerová vrchovina	16 771	10 612
CHKO Latorica	23 298	3 963
CHKO Dunajské luhy	12 284	6 359
Together	522 679	381 507

Source: Ministry of the Environment of SR

Small-area protected territories on forest land represent remains of the most preserved forest communities of the national and European significance. Forest stands with the structure of virgin forests, natural forests or semi-natural forests and plant communities related to them, which are slightly changed by human activity or their occurrence is considerably spatially constrained, form small-area protected territories. They are situated in locations from floodplain forests to mountain pine zone. Due to their unique character Carpathian beech virgin forests that are stretching to Ukraine altogether with the hollows of Slovenský raj with some selected karst valleys of Slovakia are nominated for enrolment into the List of UNESCO World Natural Heritage. We can classify mainly 479 localities with 1 319 protected trees, protected ranges and protected landscape components – arboreta, orchards, gardens into this category of localities that were determined with regard to cultural and spiritual values.

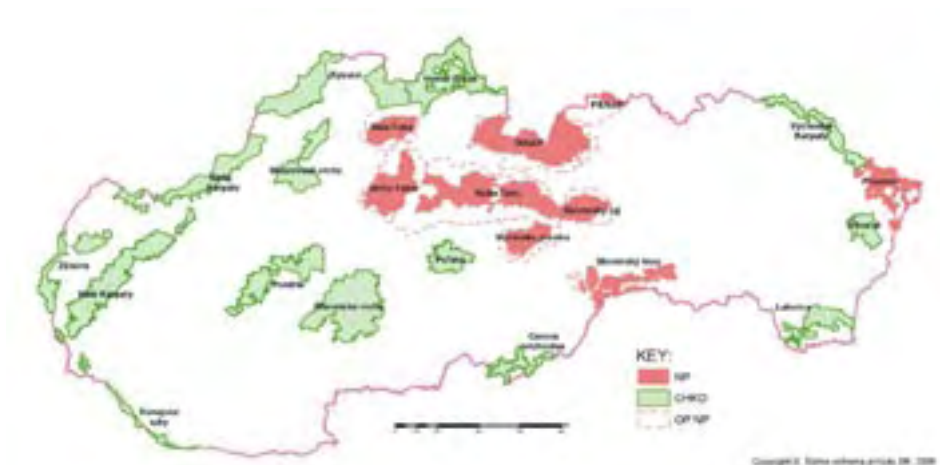


Figure 69 Overview of national parks, their protection zones and protected landscape areas in Slovakia

Table 11.1 – 4 Area of small-area protected territories

Category of MCHO	Number of forest MCHO	Area without OZ (ha)	Of that forest land (ha)	Area of OZ	Of that forest land
National nature preserve	207	83 712	66 511	2 591	531
Nature preserve	291	12 848	8 988	168	69
National nature landmark	52	59	18	657	242
Nature landmark	112	1 544	802	148	130
Protected range	39	5 201	476	5	5
Together	701	103 364	76 795	3 569	977

Source: Ministry of the Environment of SR

Explanatory notes: MCHÚ – small-area protected territory; OZ – protection zone

Independently on the national systems of protected territories the EU member states have been constructing a continual European ecological system of special protection areas Natura 2000. In April 2004 the Slovak Republic submitted to the EC National List of Proposed Protected Bird Habitats (PBH) and National List of Proposed Territories of European Significance (TES) that were in advance approved by the Resolution of the government of SR.

The National List of Proposed PBH approved the government of SR by the Resolution no. 636/2003 on 9 July 2003. The list contains 38 territories with the total area 1 236 545 ha what represents 25.2% of the territory of Slovakia.

The reimbursement amount for the restriction in current management on forest land (52% of proposed area) was estimated at 245 million SKK per year. Overlapping of PBH with existing network of protected areas is 55.2% in Slovakia. Three habitats of the proposed PBH were declared at the end of 2005. They are Horná Orava (2004), Malé Karpaty (2005) and Lehnice (2005). Public notices were prepared and discussions with owners were held for other proposed PBH.

The government of the SR approved the National List of Proposed PBH by the Resolution No. 239/2004 on 17 March 2004. It was issued in the form of Decree of the Ministry of



Environment of the SR No. 3/2004-5.1 on 14 July 2004. The list contains 382 proposed habitats with the area 574 745 ha, what represents 11.7% of the whole area of Slovakia. The area of the TES is overlapping with the current national network of protected territories in 86%. They are significant from the point of biotopes protection and protection of species, which are not sufficiently covered in the present network of protected territories. Forests cover 86.5% of proposed TES. On the area of about 68 000 ha the requirements of protection are stricter (estimated increase of the reimbursement due to restriction on current management reaches 15.6 million SKK).

In 2005 European Commission started with expert evaluation of the National List of the TES. Slovakia submitted a sufficient proposal for 114 types of biotopes and species within alpine bio-geographical region. Slovakia has still to add other territories to its national list for 39 types of biotopes and species. Implementation of further research is necessary for 19 types of biotopes and animal species. A proposal of 85 types of biotopes and species is sufficient for the Pannonian bio-geographical region. Another research has to be executed for 16 species and types of biotopes as well as other territories for 44 species and types of biotopes must be included in the national list.

The SR informed the EC on the time schedule to complement the National List in accordance with suggestions from bio-geographical seminars. The Ministry of Environment of SR will declare the territories approved by the EC in national categories after discussing this issue with the owners and users of concerned lands.

“Preliminary protection” is valid for proposed PBH and proposed TES. It lies in the assessment of impacts on the environment pursuant to valid legislation. It is necessary to monitor the occurrence of endangered forest species with the aim of implementing sustainable management on the national level. In 2001 the Red Book of plants and animals of Slovakia was worked out, where protected plants, animals and priority species are listed. A special database for “forest” species does not exist yet due to the problems with their definition from the viewpoint of species biology.

## 11.2. Certification of sustainable forest management

*Certification by FSC system* – 5 certificates of forest management were issued by the system of FSC to 1 April 2006 in the SR. They cover the area of 162 899 ha. In 2005 audits were carried out in Lesy SR, š. p., namely in regional forest enterprises Považská Bystrica and Trenčín. Thus the share of FSC certified forests being managed by Lesy SR, š. p., increased to 115 000 ha. Other 20 300 ha were certified on the basis of group scheme under the management of the Union of Diocesan Forests in Slovakia. Number of wood processing companies with the certification of consumer chain increased to 18. The process of creation of National FSC standards has started as well. Six-member commission with the representatives of economy, environment and social association was established. The task of this commission is to prepare a proposal of standards for further comments.

*Certification by PEFC system* – State of forest certification and consumer chains by PEFC system has not changed in comparison to 2004. The company Jaakko Poyry Management Consulting (JPMC) carried out audit of the Slovak forest certification system (SFCS) on 6<sup>th</sup>–8<sup>th</sup> April 2005. A visit of the member of the evaluation team in Slovakia was a part of this

audit. Development, implementation processes, credibility and SFCS effectiveness were examined during three-day working stay. On 12 August 2005 the Board of PEFC accredited SFCS system for 5-year period on the basis of the results of independent evaluation. Since that time all SFCS certification holders can label their products with PEFC logo on the basis of a license.

### 11.3. Water management

The SR joined the intention to gradually introduce the principles of integrated basin management into the practice. Forest management in relation to water management comes out from the knowledge that forests influence:

- Balance of the runoff from the catchments; forests decrease maximal and increase minimal runoff,
- River water content; forests decrease losses from evaporation,
- Increase of the underground runoff and increase of the reserves of water resources,
- Water quality and hygiene; forests eliminate pollution, mineralisation and eutrophication.

Table 11.3 – 1 Stand land area by the particular function relating to water

Function	Function significance (ha)		Total (ha)
	1 <sup>st</sup> place	2 <sup>nd</sup> place	
Water-management	73 182	161 938	235 120
Water-protective	16 604	25 977	42 581
Erosion control	244 513	844 190	1 088 703
Soil erosion control	4 456	7 794	12 250
Avalanche control	4 673	176	4 849
Bank-protective	1 019	—	1 019
Together	344 447	1 040 075	1 384 522

Source: Summary data on the forests in SR, 2006

A priority of forestry is to ensure the proper forest management in a manner to meet their functions at maximum in relation to water. Forests secure soil protection against surface water destruction, avalanches and against other harmful processes.

In Slovakia these functions were determined according to functional classification in relation to water as follows: water-management, water-protective, erosion control, bank-protective and avalanche control functions. The area of the stand land of these forest types has been growing every year.

Figure 70. Forests are managed in a way to fulfil their own functions the best in relation to water



Climate change results in higher number of local as well as regional floods, which have serious consequences. In previous years a large damage to communications, watercourses, distribution networks, agriculture, forestry and residential units occurred. A detailed overview on damage to watercourses in the administration of state forest organisations is given in Table 11.4 – 1.

#### 11.4. Forest-technical reclamations and small watercourses

At present forest-technical reclamations and torrent control are executed in accordance with the resolution of the Slovak government No. 731/1995. Until 1989 forest sector organisations invested into these works approximately 100 million SKK a year. Nowadays this activity has been in recession or it is not implemented at all. Emergency situation is solved either to the detriment of the profit of state forest organizations or by redemption of verified emergency cases by the insurance company. Built-up constructions are devastated and riparian stands (bio-corridors) in surroundings of small watercourses have been declining.

Of the 760 km built-up constructions in torrent control that are in the administration of state forest organizations about 80% are situated in urban areas. Total length of registered small watercourses in Slovakia is 48 540 km, of them 18 054 km are in the administration of forest state organisations under the Ministry of Agriculture of the Slovak Republic. It is less by 413 km in comparison with 2004 due to continuing delimitation in favour of the State Water Management Enterprise.

Act No. 364/2004 on water came into effect on 1st July 2004. This act creates preconditions for all-side protection of surface and underground water, including directly dependent land ecosystems, and it governs the rights and duties of private persons and legal entities to surface water, real estates connected with them, as well as creates preconditions for the protection against floods and determines the obligations of the state administration in these areas.

In 2000 the government of the SR approved the “Programme on Flood Control in SR by 2010”. There were provided 25 million SKK for this purpose to Lesy SR, š. p., for the implementation of torrent control in 2005.



*Figure 71 Programme of flood control and prevention has not been implementing due to lack of finances*

Table 11.4 – 1 Damage to watercourses in the administration of state forest organisations in thousand SKK

	2000	2001	2002	2003	2004	2005	Together
Damage	30 850	5 165	55 448	0	11 006	9 760	112 229
Compensated	8 247	385	26 420	0	3 889	0	38 941
Difference	-22 603	-4 780	-29 028	0	-7 117	-9 760	-73 288

Source: Information on the economic result of forest state enterprises and organisations in 2005

As it follows from the following table the programme on the flood-protection has been not implemented for a long time because of the shortage of financial resources. Receipts for the surface water take-off in case of small watercourses are for their managers 2 million SKK, what documents that the implementation of flood control measures is realistic only in the case of their financing from the state budget.

Table 11.4 – 2 Programme on flood control by 2010 in thousand SKK

Ministry of Agriculture of SR	Fulfilment						
	2000	2001	2002	2003	2004	2005	2000–2005
Programme by 2010	11 574	22 209	41 500	100 000	100 000	100 000	375 283
Fulfilment	11 574	22 209	19 491	41 672	31 865	40 515	167 326
Difference	0	0	22 009	58 328	68 135	59 485	207 957
Fulfilment	State budget	9 280	10 237	1 678	28 500	30 678	122 607
	Other resources – ŠFZL, PPA	2 089	10 246	900	12 000	0	25 235
	Own resources	205	1 726	3 913	1 172	11 281	19 484
	Together	11 574	22 209	19 491	41 672	31 865	167 326

Ministry of Agriculture of SR	Assumption					
	2006	2007	2008	2009	2010	2000–2010
Programme by 2010	22 150	200 000	200 000	200 000	200 000	822 150
Fulfilment	State budget	2 000	175 000	170 000	165 000	677 000
	Other resources – ŠFZL, PPA	0	15 000	20 000	25 000	85 000
	Own resources	20 150	10 000	10 000	10 000	60 150
	Together	22 150	200 000	200 000	200 000	822 150

Source: Ministry of Agriculture of SR

Explanatory notes: ŠFZL – The State Fund for the Improvement of the Forests in the Slovak Republic, PPA – Agricultural Payment Agency

### 11.5. Wood-processing industry

The present state and development of wood-processing industry is showed in following tables in according to selected indicators.

An abrupt increase of timber deliveries in 2005 when compared with 2004 by almost 30% was almost in 70% absorbed by domestic wood processing subjects. Timber export increased only about by 679 thousand m<sup>3</sup>, particularly from 1 136 thousand m<sup>3</sup> to 1 815 thousand m<sup>3</sup>.





Relationships between forestry and wood-processing industry are developing on the basis of professional approach to business, partnership and cooperation.

*Figure 72 Since 2000 we can observe a considerable increase of the production of fuel forest chips*

*Table 11.5 – 1 Wood processing in sectors of wood industry in thousand m<sup>3</sup>*

Sector	Actual state in year			Assumption for 2006	Expectation for 2007
	1990	2004	2005		
Wood industry	2 300	4 026	5 069	4 400	4 400
Pulp and paper industry	1 880	1 937	2 302	2 400	2 400
Together	4 180	5 963	7 371	6 800	6 800

Source: Ministry of Economy of SR

Explanatory note: Data in 2004–6 are without fuel wood consumption

*Table 11.5 – 2 Selected indicators of wood industry in million SKK*

Indicator	Sector	Actual state in				Assumption for 2006	Expectation for 2007
		1990	2003	2004	2005		
Revenues	WI	9 138	14 996	17 138	19 940	20 000	22 000
	FI	10 088	32 099	30 175	33 000	35 000	38 000
	PPI	29 564	36 208	39 958	45 343	46 000	48 000
	WPI	48 790	83 303	87 271	98 283	101 000	108 000
Costs	WI	9 455	15 197	16 451	19 166	19 200	21 000
	FI	10 282	31 358	29 996	31 439	33 000	35 000
	PPI	28 225	33 463	38 787	43 635	44 000	46 000
	WPI	47 961	80 017	85 234	94 241	90 900	102 000
Economic result before taxation	WI	–316	–201	687	774	800	1 000
	FI	–194	741	180	1 561	2 000	2 000
	PPI	1 339	2 746	1 171	1 708	2 000	2 000
	WPI	829	3 286	2 037	4 043	4 800	5 000
Number of jobs	WI	x	9 096	8 604	9 924	10 000	10 200
	FI	x	11 015	11 200	11 830	12 000	12 300
	PPI	x	8 509	7 600	7 458	7 500	7 600
	WPI	x	28 592	27 377	29 212	29 500	30 100

Source: Ministry of Economy of the Slovak Republic, 2006

Explanatory notes: WI – wood industry, FI – furniture industry, PPI – pulp and paper industry, WPI – wood-processing industry (total)

Table 11.5 – 3 Production and consumption of wood products in m<sup>3</sup> and in tons per capita

Assortment	1990	2000	2004	2005
Sawn wood – production	0.269	0.191	0.341	0.487
Sawn wood – consumption	0.260	0.029	0.271	0.336
Particle boards – production	0.057	0.043	0.056	0.058
Particle boards – consumption	0.057	0.046	0.046	0.061
Fibreboards – production	0.012	0.012	0.028	0.160
Fibreboards – consumption	0.090	0.090	0.033	0.200
Pulp – production (in tons)	0.085	0.114	0.097	0.113
Pulp – consumption (in tons)	0.076	0.114	0.096	0.114
Paper and cardboard – production (in tons)	0.082	0.173	0.148	0.159
Paper and cardboard – consumption (in tons)	0.061	0.154	0.098	0.155

Source: Ministry of Economy of SR, Statistical Office of SR, FRI Zvolen

## 11.6. Wood use for energy purposes

Interest in wood use as a source of energy, which is produced in forestry, wood-processing industry and pulp and paper industry, is gradually increasing because of the growing prices of basic fuels and energy. It is mainly going about houses and estates fumigation in house-communal sphere.

Table 11.6 – 1 Utilisable annual potential of fuel dendromass in the SR

Producer	Dendromass kind	Annual amount, Ths t	Energy equivalent PJ
Forestry	Fuel wood	480	4.6
	Smallwood and unprocessed raw wood	1 160	11.0
	Stumps and roots	40	0.4
	Waste after the wood mechanic processing in forestry	130	1.2
	Waste from cleanings	30	0.3
	Handling waste	130	1.2
	Overmature stands	300	2.9
	Together	2 270	21.6
Wood processing sector	Bark, Wood dendromass after mechanic processing, Liquid waste from pulp and paper industry	1 750	22.1
Agriculture	Dendromass from permanent grasslands, Fruit orchards	170	1.6
Communal sphere total	Urban tree green, riparian stands, Windbreaks, Alleys, Communal wood waste	230	2.4
Utilisable potential of fuel dendromass		4 420	47.7

Quicker and more effective development of wood use for energy purposes in the SR is slowed by insufficient implementation of direct and indirect supporting measures, what negatively influences the pursuance of commitments resulting from the SR membership in the EU. Development of the wood use for energy purposes advance the directives 2001/77/EC on the promotion of electricity produced from renewable energy sources, 2003/87/EC on a scheme for greenhouse gas emission allowance trading, 2004/8/EC on the promotion of cogeneration based on a useful heat demand in the internal energy market, 85/337/EC on assessment of effects on the environment and White Book of

26. 11. 1997, where the 12% proportion of renewable energy resources from the total consumption of the EU member states is determined.

Further growth of the utilisable wood potential for energy purposes is assumed because of the timber cut increase in the forest management and by the development of its assortment structure, by building and improvement of domestic capacities use of wood processors. A question of alternative non-forest land use for fuel biomass production became topical.

A present utilisable potential of wood for energy purposes constitutes more than 5.5% share on annual consumption of primary energy sources of the SR with the perspective of its growth.

Except the increasing interest in fuel wood for family houses fumigation, significant growth occurred in forest chips production at Lesy SR, š. p., where the year production exceeded the number of 100 thousand tons and almost 50% of the production was exported to Hungary. Other firms also produced forest chips, chiefly by the course of wind throw processing.

Table 11.6 – 2 Annual amount of dendromass for energy use produced in forestry

Year	Forest chips			Fuel wood and other <sup>1)</sup>			Together		
	Ths t <sup>2)</sup>	TJ	%	Ths t	% TJ	%	Ths t	TJ	%
1990	2	19	0	368	3 496	0.4	370	3 515	0.4
2000	5	48	0	471	4 475	0.6	476	4 523	0.6
2003	14	133	0	546	5 178	0.7	560	5 311	0.7
2004	25	238	0	598	5 572	0.7	622	5810	0.7
2005	120	1 140	0.1	640	6 080	0.7	760	7 220	0.8
2006 <sup>*)</sup>	200	1 900	0.3	650	6 175	0.8	850	8 075	1.1
2007 <sup>**)</sup>	240	2 280	0.4	670	6 365	0.8	910	8 645	1.2

Explanatory notes: <sup>\*)</sup>assumption, <sup>\*\*)</sup>expectation, <sup>1)</sup>fuel wood and wood used for the energy from waste, residue after cutting and snags, <sup>2)</sup>forest chips + wood intended for forest chips production

## 11.7. Rural development

Rural character of the SR mainly results from natural conditions where mostly altitude and land mountain character predetermine the system of settlement centres, which are typically rural according to the number of inhabitants. Settlement network is very disintegrated in Slovakia. It consists of 2891 villages; of them small villages with no more than 1 000 inhabitants constitute about 67% with 16% of total population.

In 2005 the European Agricultural Fund adopted Council Regulation (EC) No. 1698/2005 on Support for Rural Development. Improvement of the quality of life in rural areas and support of economy activity diversification belong to its main objectives. Measures under the Axis 3 “Quality of Life in Rural Areas and Diversification of Rural Economy”, which include diversification of non-agricultural activities, support for establishment and development of micro-enterprises with the objective to support business, develop the structure of economy and support tourism activities in rural areas.

A conception of rural development in the EU shifts from sector to regional approach and to the diversification in agriculture. A conclusion was reached that the development of

rural areas cannot be established only on agriculture. Diversification of activities is an inevitable part of the sustainable rural development. Thus greater possibilities are created for forestry in the rural area. Alternative use of the agricultural land (permanent grassland, arable land) and extensively used or unused lands (surroundings of communications, watercourses, devastated areas and so on) is a significant factor influencing the rural development in the future. A present state is the result of attenuation and a change in agricultural production structure and other economy activities.



*Figure 73 Support to activities in tourism and use of forests for recreation contribute to rural development*

At the present time the measures aimed at sustainable rural development are carried out through the Programme of Rural Development and Sectoral Operation Programme, which are adopted for the period of 2004–2006.

### 11.8. Game management

Total area of the hunting land is 4 436 461 ha. The area of agricultural land is 2 328 thousand ha, of forest land 1 980 thousand ha, of water areas 51 thousands ha and of others 78 thousand ha.

*Hunting grounds* – In 2005 there were 1 806 hunting districts in Slovakia. 23 of them were independent game preserves and 16 pheasantries. In 2005 an average area of hunting ground was 2 456 ha (in 1990 it was 3 391 ha, it means greater by 935 ha).

Lesy SR, state enterprise Banská Bystrica had 136 overhead hunting grounds with the area of 515 695 ha (12%). 21 hunting grounds with the area of 167 684 ha (4%) were managed by other state organisations (Military Forests and Estates of the SR, state enterprise Pliešovce, school forests, State Forests of the TANAP, Forest-Agricultural Estate, state enterprise, Ulič, and others). There were 67 overhead hunting grounds with the area of 176 269 ha (4%). Hunting associations had 1 356 hunting grounds with the area 3 082 350 ha (69%), and other subjects had 226 hunting grounds. These subjects are not a part of the Slovak Hunting Union and the area of their grounds is 494 463 ha (11%). Also in 2005 the number of other grounds put on lease increased the most outside the Slovak Hunting Union (by 45, with the area of 106 127 ha).

Other state organisations have the largest hunting grounds what concerns the area (by average 7 985 ha), followed by indirect hunting grounds of Lesy SR, state enterprise, Banská Bystrica (3 792 ha). These grounds represent the core of ungulate game keeping in all hunting areas. Other grounds put on lease (2 188 ha) and hunters' association (2 273 ha) had the smallest average area. Number of hunting grounds is increasing, but their average



area is decreasing. The number of hunting grounds put on lease by Hunters' Association of the Slovak Hunting Union is decreasing. The number of hunting grounds put on lease to the subjects not belonging to the Slovak Hunting Union is increasing.



Figure 74 Rearing of pheasants in aviary contributes to increasing the stock of pheasants

*Main game species* – Spring stock of ungulates was higher to 31 March 2005 in comparison to previous year except for wild boar. This tendency can be observed from 1998. Another increase in the number of individuals of ungulates, except for roe deer, is undesirable because of the growing damage to forest stands and agricultural cultures caused by roe deer. Shooting of red deer, fallow deer and mouflon was higher in 2005 than in previous year, but despite that the shooting plan was not fulfilled. Shooting of roe deer and wild boar was lower. Spring stock of pheasant, rabbit and wild turkey has increased. Spring stock of hare and partridge has decreased.

Table 11.8–1 Ungulates and small game in Slovakia

Game species	Number of individuals					
	Spring stock of game	Shooting	Trapping	Mortality	Together	Stocking
Red deer	39 738	12 723	48	1 259	14 030	0
Fallow deer	8 425	2 257	68	204	2 529	28
Mouflon	9 128	2 451	152	174	2 777	61
Roe deer	85 124	17 170	4	3 485	20 659	3
Wild boar	27 116	21 804	135	612	22 551	25
Pheasant	181 696	127 944	2 221	13 262	143 427	120 912
Hare	199 226	21 818	10 496	4 197	36 511	574
Rabbit	923	0	0	126	126	374
Partridge	17 293	36	0	448	484	124
Wild duck	0	8 658	0	207	8 865	7 000
Wild turkey	140	32	0	12	44	63

Source: Statistical yearbook for hunting in the SR for the year 2005

Litter size of carnivorous animals, except for wildcat, has increased in accordance to statistics. The number of other rare animal species has gently decreased in comparison to the previous year except for the otter, black cock, bison and beaver. Hunt of the rare animal species is strictly regulated. Permitted shooting of the bear was in the number of 66, but only 35 were shot. A pursuance of permitted hunt on bear stagnates for several years. The main reason for not observing this rests on restricted conditions determined by the environment ministerial department. 74 individuals of wolf and 8 individuals of chamois of alpine origin were hunted. There was registered a considerably higher number of chamois (625) than in previous year (522).

Table 11.8–2 Rare animal species in Slovakia

Animal species	Number of individuals			
	Spring stock of game	Permitted hunt	Real hunt	Mortality
Chamois	625	11	8	4
Bear	1 483	66	35	3
Wolf	1 165	110	74	2
Lynx	1 080	5	0	1
Wild cat	1 452	0	0	3
Otter	343	0	0	6
Capercaillie	1 491	0	0	3
Black cock	1 067	0	0	1
Hazel grouse	7 443	70	5	37
Marmot	952	0	0	0
Elk	2	0	0	0
Bison	18	0	0	1
Beaver	220	0	0	3

Source: Statistical Yearbook for Hunting in SR for the year 2005

*Game management economy* – In 2005 revenues in game management were 208 472 thousand SKK and expenses 222 773 thousand SKK, what means a minus economic result of 14 301 thousand SKK. In 2004 it was -10 087 thousand SKK. A plus economic result was observed in overhead hunting grounds of state forest enterprise Lesy SR and approximately balanced result in the grounds put on lease by hunters' association of the Slovak Hunting Union. Other groups of hunting grounds had negative economic result.



Figure 75 Badger (*Meles meles*) is one of rare game species in Slovakia





## 12. COOPERATION WITH FOREIGN COUNTRIES

### 12.1. Participation of the Slovak Republic in the World and European processes in forestry

#### *FAO Committee on Forestry (COFO)*

On 14 – 19 March 2005 was held the 17th Session of the FAO Committee on Forestry jointed with the Ministerial Meeting on Forests held on 14 March 2005. More than 600 delegates participated in the Session.

The Ministerial Meeting on Forests was dedicated to three key points:

- Fostering international commitment to sustainable management in forests.
- International cooperation on forests fires.
- The role of forest sector in rehabilitation and reconstruction of the areas affected by the Indian Ocean tsunami in December 2004.

The countries within the report adopted by the ministers and high government representatives of 126 countries were called for solution of the given issues: improvement of forest management, enhancing cooperation on forest fires, improvement of forest law enforcement and governance, improvement of intersectoral cooperation and coordination of forest policies with economic, environmental and social policies, fulfilment of commitments in the UN Millennium Declaration, support of national-level forest resources assessment and reporting, enhancing FAO leadership role in forestry internationally.

The session of the Committee on Forestry has dealt with the issues as how to implement commendations of ministers. The discussion has emphasized following items:

- The vital role of forests in achieving the Millennium Development Goals (MDG), particularly poverty alleviation and improvement of environmental sustainability.
- The need to incorporate forestry in national poverty reduction strategies.
- Critical role of civil society in implementing national forest programmes.
- The role of private sector in sustainable forest management.
- Need of developing international cooperation in forest fire management.
- The importance of forests as a source of bioenergy and as a mean of mitigating climate change.
- The key role of FAO Regional Forestry Commissions in regional action, particularly in such areas as valuation of environmental services, forest and water, international cooperation in monitoring and prevention of forest fires, illegal logging and associated trade of forest products, combating the threat of invasive species.

#### *United Nations Forum on Forests (UNFF)*

The fifth session of United Nations Forum on Forests (UNFF5) was held on 16 – 27 May 2005 in New York. Its principal goal was to review the status of preparation of the International Arrangement on Forests (IAF) and, if necessary, to revise the proposed text. During two weeks delegates have valued the progress and effectiveness of IAF. They have discussed on future actions, development of legal framework on all types of forests,



enhancing cooperation and programme coordination. At the end of the session, the forum was unable to reach an agreement on enhancing the International Arrangement on Forests and did not agree the proposed text of Ministerial Declaration. The summary submitted by the Chairman of the Forum comprised, inter alia, the following four global goals for forests:

- Reverse the loss of forest cover worldwide through the sustainable forest management including protection, restoration, afforestation and reforestation of forests.
- Enhance forest-based benefits and the contribution of forests to the achievement of internationally agreed development goals, including Millennium Development Goals.
- Increase significantly the area of protected forests and sustainable managed forests and increase the proportion of forest products from sustainably managed forests.
- Reverse the decline in the Official Development Assistance (ODA) for sustainable forest management.

It is expected, depending on a decision on future sixth session of UNFF in 2007, that the countries will take the national-level voluntary measures for achieving the goals and submit the national periodic reports to UNFF at the beginning of 2007.

#### *Ministerial Conference on Protection Forests in Europe (MCPFE)*

In 2005, the Liaison Unit Warsaw (LUW) worked according to the approved programme on a preparation of the Fifth Ministerial Conference, which will be held in November 2007. The achieved progress has been reviewed at the Expert Level Meeting. In addition to the assessment of current activities, the attention has been paid at the up-to-date political issues resulting from the international dialogue on forests. The relevant political issues were highlighted for formulating the strategic guideline for continuous support to sustainable management in forests and creating future optimal model of MCPFE.

There have been discussed also the future actions and especially the state-of-the-art of the MCPFE Report "State of Forests and Sustainable Forest Management in Europe 2007/2008". Elaboration of the report is the main task of the Team of Specialist on Monitoring Forest Resources established within the implementation of Integrated Work Programme in cooperation with the United Nations Economic Commission for Europe (UNECE).

#### *Europe and North Asia Forest Law Enforcement and Governance (ENA FLEG)*

In 2005, the Europe and North Asia Forest Law Enforcement and Governance Ministerial Conference took place in Russian Federation. The goal was to achieve the international high-level political commitment to take actions against the illegal logging, associated trade and corruption. The goal should be reached by establishing a political area on a national and regional level. The participating governments in partnership with significant stakeholders from the civil society and private sector should complexly dedicate to these politically sensitive issues. Within the process, the need for common effort and responsibility among the countries, important wood and wood products producers, trade and consumers is emphasized. The outcome of the conference was development of significant documents of the Ministerial Declaration and Indicative List of Actions and their adoption by official representatives of participating countries.

### *Timber Committee United Nations Economic Commission for Europe (TC UNECE)*

The work of the UNECE Timber Committee is based on Integrated Programme of Work (IPW) on forest and timber approved for 2005–2008. Its goal is to contribute to achieving sustainable forest management, including the sound and legal use of wood and other forest products and services, throughout the UNECE region, and to ensure measurement of that progress. The Integrated Programme of Work has the five work areas:

- Forest products trade and statistics
- Forest resource assessment and indicators of sustainable forest management in the region
- Forest sector outlook studies
- Social and cultural aspects of forestry
- Policy and cross-sectoral issues

Thirty-third Session of UNECE Timber Committee was held on 26 – 30 September 2005 in Geneva. The session mainly:

- Assessed the position and strategic guideline for ECE/FAO in changing international environment,
- Organized discussion on wood trade and market on topic: Forest certification policies' influence on forest products market in the UNECE region.
- Held Policy Forum: Forest Certification – Do governments have a role?
- Dealt with preparation of the regional FAO European Forestry Commission session in Slovakia in May 2006.

The first inaugural meeting of the Team of Specialists on Monitoring Forest Resources in the UNECE Region was held on 25 – 27 April 2005 in Geneva. The most topical task of the team is to elaborate data for the MCPFE Report in 2007 “State of Forests and Sustainable Forest Management in Europe”.

International support and initial seminar “Policy options for storm damage management“ in the High and Low Tatra Mts.” held in Zvolen – Sielnica in April 2005 was included into the main FAO programme.



*Figure 76 The Palace of Nations in Geneva is the place of annual meeting of the ECE Timber Committee*

## 12.2. Implementation of the principal bases of the EU Forestry Strategy in forestry in the Slovak Republic

In 2005, the European Commission put forward a Communication to the Council and European Parliament on implementation of EU Forestry Strategy (COM (2005) 84). This

Communication responds to the request of the Council that charged the Commission to report on implementation of the EU Forestry Strategy after five years of its adoption in 1999. In preparing this report, the Commission carried out consultations with the Member States and stakeholders within the European Commission (Standing Forestry Committee, the Advisory Group on Forestry and Cork) and further consultations. This Communication presents the detailed analysis and emerging issues affecting forests and forestry and outlines possible actions for the future. In this document, the Commission proposed to the European Parliament to develop a EU Action Plan for Sustainable Forest Management.

In October 2005, a vision and strategic goals of the EU Action Plan for forestry were proposed. It is expected that EU Action Plan will focus on providing framework for the implementation of forest-related actions at Community and Member States level. It should serve as an instrument of co-ordination between Community actions and the forest policies of the Member States. The main principles of the action plan should be:

- Recognizing the sustainable forest management and multifunctional role of forests as the basic common principles,
- Accepting the national forest programmes as a suitable framework for implementing the international forest-related commitments,
- Considering the global and cross-sectoral issues in forest policy,
- Contribution to enhancing the competitiveness of the EU forest sector,
- Improving management and governance of EU forests,
- Respect for the principle of subsidiarity.

The vision has also defined the strategic goals of the EU Action Plan for forestry considered in the part related to forestry in the Conception of Agriculture Development for 2007–2013.

In 2005, the Council, within the policy of rural development, approved the Regulation No. 1698/2005 on support for rural development by the European Agriculture Fund for Rural Development. The Regulation lays down the general rules governing Community support for rural development. It also defines the objectives to which rural development policy is to contribute, priorities and measures for rural development, partnership, programming, evaluation and financial management, monitoring and control on the basis of responsibilities shared between the Member States and the Commission.

### 12.3. Use of European Union support programmes

Since the year 2000, the most significant pre-accession programme of the European Union for the non-state forests subjects has been the EU SAPARD (Special Accession Programme for Agriculture and Rural Development). By 31 December 2005, 36 forest projects were implemented within this programme valued at the amount of 61 215 thousand SKK, of those 39 million SKK financed by the European Union. In majority the projects have oriented at a purchase of special forest technique, computers and modern technology for primary wood processing and forest nurseries.

In 2004, the follow-up of SAPARD was the Sector Operational Programme (SOP) Agriculture and Rural Development, which is the principal programming document in the Slovak Republic for 2004–2006 designed for drawing down the financial means from EU structural funds to forestry. It is aimed at implementation of measures with following objectives:

- Improving the health condition of forests in the areas damaged by pollution,
- Elimination of damages in forest stands caused by natural disasters and biotic pests, especially by bark beetles,
- Building and reconstruction of forest roads and
- Purchase of special technique.

In 2005, 127 projects at the amount of 408 million SKK were submitted for drawing funds for these measures. The budget from public sources has been planned at the amount of 96 million SKK. The Rural Development Plan in the Slovak Republic in 2004–2006 is focused on forestry measures in the Bratislava County, and afforestation of lands unused for agriculture. In 2005, there were submitted 5 projects at the amount of 12 million SKK.

#### 12.4. Comparison of some forestry indicators in the Slovak Republic with selected European countries

The table presents the basic indicators of some European countries with a great forest sector from the results of the Global Forest Resource Assessment (GFRA) 2005 published by the FAO Forestry Department in January 2006.

*Tabuľka 12.4 – 1 Comparison of some forestry indicators in the Slovak Republic with some European countries*

Country	Forest area (Ths ha)	Forest coverage (%)	Indicator					
			Forest ownership		Annual felling volume (Ths m <sup>3</sup> )	Carbon stock in forests (Mil ton)	Growing stock including small wood (Mil m <sup>3</sup> )	Growing stock per ha, including small wood (m <sup>3</sup> )
			State	Non-state				
			(%)					
Slovak Republic	1 931	40.1	41.8	58.2	7 268	510	494	256
Czech Republic	2 648	34.3	76.7	23.3	17 274	572	736	278
Austria	3 862	46.7	19.6	80.4	20 127	853	1 159	300
Poland	9 192	30.0	83.2	16.8	33 015	903	1 864	203
Hungary	1 976	21.5	60.5	39.5	5 528	302	337	171
Germany	11 076	31.7	52.8	47.2	60 770	2 188	2 880	260
France	15 554	28.3	26.0	74.0	51 475	2 305	2 465	158
Sweden	27 528	66.9	19.7	80.3	76 780	1 505	3 155	115
Finland	22 500	73.9	32.1	67.8	64 295	830	2 158	96
Norway	9 387	30.7	14.0	86.0	9 219	363	863	92
Romania	6 370	27.7	94.3	5.7	17 300	1 440	1 347	212
Ukraine	9 575	16.5	100.0	0.0	14 820	849	2 119	221
Latvia	2 941	47.4	54.0	46.0	11 500	583	599	204
Slovenia	1 264	62.8	27.7	72.3	3 153	260	357	283

*Source: Global Forest Resources Assessment 2005, FAO Forestry Paper 147, ISBN 92–5–105481–9*





### 13. PROPOSAL OF MEASURES FOR IMPLEMENTATION OF CONCEPT INTENTIONS IN 2007

The measures resulting from the proposal of the Conception of Agriculture Development for 2007–2013 – part Forest Management

#### 1. To develop a support system on increasing the sustainable production and utilization of wood fuel biomass by financial and legislation measures

Term: year 2007

Will be ensured by: Ministry of Agriculture of the Slovak Republic in co-operation with the National Forest Centre in Zvolen and the Ministry of Economy of the Slovak Republic

Substantiation:

This measure is in accordance with the international commitments of the Slovak Republic in the area of renewable energy utilization, as well as with a proposal of the Conception of Agriculture Development for 2007–2013. The measure harmonizes with necessity of solving the country's energy sufficiency, reduction of financial demands on fuel import, reduction of greenhouse gas production, as well as with solving the rural development issues and alternative use of non-forest land. Based on this measure, 5% proportion of wood fuel biomass on coverage of the total consumption of primary energy sources in Slovakia should be reached.

#### 2. To develop the report on the ownership rights to forest real estates

Term: year 2007

Will be ensured by: Ministry of Agriculture of the Slovak Republic, Forestry Section

Substantiation:

The acceleration of settling the ownership and users' rights to forest real estates should be secured during the future period, as well as to establish the conditions for rational and effective management of forest property under the ownership of non-state subjects.

#### 3. To submit the National Forest Programme to the Government of the Slovak Republic

Term: March 2007

Will be ensured by: Ministry of Agriculture of the Slovak Republic in cooperation with the National Forest Centre.

Substantiation:

The goal of the document of the National Forest Programme is to develop and up-to-date the priorities of the forest management in detail. It will fully harmonized with the priorities of the European Union in the field of forest management declared by an EU Forest Action Plan and will be developed based on the National Strategy Plan of Rural Development for the period of 2007 – 2013.





## 14. ANNEXES

### 14.1. References

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## 14.2. Tables

Table 1 Basic financial indicators of the forest sector in the Slovak Republic

No.	Indicator	Measurement unit	Actual state in year				Assumption for 2006	Expectation for 2007
			1990	2003	2004	2005		
1	Sales and revenues	Mill SKK	4 531	10 555	11 484	13 779	11 248	11 162
2	Timber returns		2 604	8 355	9 468	11 355	8 443	8 496
3	Other sales and revenues		920	1 878	1 851	2 399	2 770	2 626
4	Direct costs of silvicultural operations		565	1 238	1 247	1 476	1 342	1 329
5	Direct costs of logging operations		916	4 094	4 274	5 703	4 962	5 029
6	Total costs of silvicultural operations		1 094	1 733	1 725	1 890	1 746	1 754
7	Total costs of logging operations		1 584	5 797	5 927	7 163	6 459	6 525
8	Production costs together		4 326	10 828	10 632	13 061	10 819	10 862
9	Material costs including depreciation		1 976	4 549	4 860	5 139	5 211	5 260
10	Depreciation		596	842	820	834	817	806
11	Personal costs		2 056	3 831	3 678	4 175*	3 575	3 604
12	Of that: labour costs		1 490	2 716	2 640	2 985	2 571	2 606
13	Economic result (profit, loss)		205	-273	852	718	429	300
14	Subsidies together		1 222	355	225	198	383	230
15	Of that: Subsidies for forest operations		1 007	221	21	25	30	32
16	Subsidies for investments		108	33	60	45	52	92
17	Subsidies for other operations		107	101	144	128	301	106
18	Claims after the term of maturity		105	989	253	746	709	683
19	Liabilities after the term of maturity to 31 December		10	103	76	67	51	51

\*Including price of works secured by subjects providing services

Table 2 Main economic indicators of the forest sector in the Slovak Republic

No.	Indicator	Measurement unit	Actual state in year				Assumption for 2006	Expectation for 2007
			1990	2003	2004	2005		
1	Forest regeneration together	Ha	18 964	14 039	13 960	13 504	13 619	12 934
2	Of that: artificial forest regeneration		15 500	9 625	8 866	8 922****	9 778	9 143
3	Treatment of young stands		16 968	11 188	10 785	11 382	5 718	5 934
4	Protection of young forest stands		141 920	68 372	66 666	65 715	71 285	73 413
5	Forest protection (direct costs)	Ths SKK	95 000	102 479	111 829	136 895	134 243	131 845
6	Cleaning	Ha	34 143	32 164	30 315	29 078	29 086	29 038
7	Thinning		37 143	59 735	55 982	46 072	54 032	54 633

Table 2 – contd.

No.	Indicator	Meas- urement unit	Actual state in year				As- sumption for 2006	Ex- pectation for 2007
			1990	2003	2004	2005		
8	Timber felling together	Ths m <sup>3</sup>	5 276	6 652	7 268***	10 190	7 330	7 060
9	Of that: coniferous		2 777	3 508	4 000	6 927	4 247	3 934
10	Broadleaved		2 499	3 144	3 268	3 263	3 083	3 126
11	Incidental felling together (of line 8)		2 611	2 746	2 916	6 533	3 112	2 613
12	Of that: coniferous		1 726	2 435	2 555	6 153	2 905	2 351
13	Broadleaved		885	311	361	380	207	261
14	Buying timber together		49	118	135	5 163	145	140
15	Of that: coniferous		30	54	57	5 065	61	57
16	Broadleaved		19	64	78	98	84	83
17	Sale of timber together		5 070	6 257	7 198	9 287	6 704	6 528
18	Of that: coniferous		2 723	3 300	4 016	6 229	3 741	3 652
19	Broadleaved		2 347	2 957	3 182	3 058	2 963	2 875
20	Stumpage sale (of line 17)		60	136	97	783	93	83
21	Of that: coniferous		25	54	71	748	62	51
22	Broadleaved		35	83	26	35	31	32
23	Sale of timber in domestic market together		4 720	5 374	6 595	8 505	6 416	6 235
24	Of that: coniferous		2 531	2 946	3 702	5 610	3 506	3 322
25	Broadleaved		2 189	2 428	2 893	2 895	2 910	2 913
26	Timber export*		350	883	603	781	288	293
27	Of that: coniferous		192	354	314	619	185	181
28	Broadleaved		158	529	289	162	103	112
29	Investment together	Mill SKK	553	582	514	932	802	780
30	Of that: construction works		279	278	220	403	271	352
31	Machines and equipment		274	304	275	462	363	363
32	Other**		—	—	19	67	168	65
33	Length of forest roads to 31 December	Km	20 547	21 186	21 189	21 193	21 198	21 202
34	Length of skidding roads to 31 December		14 937	15 883	15 887	15 892	15 899	15 913
35	Length of streams in own administration	Km	19 715	19 715	19 159	18 746	16 904	15 202
36	Area of managed forest land	Ths ha	1 977	2 004	2 006	2 006	2 006	2 007
37	Staff in economic domain	Persons	36 316	18 078	14 868	13 396	12 866	12 744
38	Of those: workers		25 536	12 448	9 523	8 246	7 691	7 599
39	Average monthly earnings	SKK	3 419	12 712	14 309	15 543	16 781	17 482

Note: \*Export under the own title of forest owner (user); \*\*For example, elaboration of the forest management plan, other intangible property; \*\*\*Including extraordinary felling; \*\*\*\*Including proportional part of regeneration from the state administration decision and change in forest stands use

Table 3 Basic financial indicators of state forest organizations together

No.	Indicator	Measurement unit	Actual state in year				Assumption for 2006	Expectation for 2007
			1990	2003	2004	2005		
1	Sales and revenues	Mill SKK	4 531	6 424	7 423	9 708	7 328	7 287
2	Timber returns		2 604	4 823	5 768	7 635	4 943	5 096
3	Other sales and revenues		920	1 408	1 501	2 059	2 370	2 176
4	Direct costs of silvicultural operations		565	631	639	874	732	709
5	Direct costs of logging operations		916	2 674	2 712	3 953	3 162	3 179
6	Total costs of silvicultural operations		776	913	877	1 137	946	904
7	Total costs of logging operations		970	3 712	3 637	4 752	3 959	3 975
8	Production costs together		4 326	7 033	6 932	9 341	7 169	7 262
9	Material costs including depreciation		1 976	3 029	3 380	3 649	3 711	3 710
10	Depreciation		596	462	445	474	467	466
11	Personal costs		2 056	2 630	2 469	2 841	2 265	2 264
12	Of that: labour costs		1 490	1 846	1 764	2 041*	1 621	1 636
13	Economic result (profit, loss)		205	-609	491	367	159	25
14	Subsidies together		1 115	226	180	172	113	165
15	Of that: Subsidies for forest operations		1 007	92	16	14	10	7
16	Subsidies for investments		1	33	26	30	17	52
17	Subsidies for other operations		107	101	138	128	86	106
18	Claims after the term of maturity		105	789	103	626	609	583
19	Liabilities after the term of maturity to 31 December	Mill SKK	10	43	26	17	1	1

\*Including price of works secured by subjects providing services

Table 4 Main indicators of state forest organizations together

No.	Indicator	Measurement unit	Actual state in year				Assumption for 2006	Expectation for 2007
			1990	2003	2004	2005		
1	Forest regeneration together	Ha	18 964	8 674	8 746	8 059	7 119	7 134
2	Of that: artificial forest regeneration		15 500	5 590	5 275	5 255****	5 078	4 943
3	Treatment of young stands		16 968	6 947	7 508	8 018	1 518	1 434
4	Protection of young forest stands		141 920	36 186	36 466	36 463	39 085	40 613
5	Forest protection (direct costs)	Ths SKK	95 000	62 994	66 531	90 825	87 243	82 845
6	Cleaning	Ha	34 143	20 234	20 294	19 564	18 986	18 838
7	Thinning		37 143	39 247	34 203	27 256	32 432	33 233

Table 4 – contd.

No.	Indicator	Meas- urement unit	Actual state in year				As- sumption for 2006	Ex- pectation for 2007
			1990	2003	2004	2005		
8	Timber felling together	Ths m <sup>3</sup>	5 276	3 949	4 308***	6 507	4 030	4 060
9	Of that: coniferous		2 777	1 807	2 182	4 435	2 047	2 034
10	Broadleaved		2 499	2 142	2 126	2 072	1 983	2 026
11	Incidental felling together (of line 8)		2 611	1 421	1 599	4 356	1 312	1 313
12	Of that: coniferous		1 726	1 216	1 384	4 115	1 205	1 251
13	Broadleaved		885	205	215	241	107	61
14	Buying timber together		49	8	15	5 003	5	10
15	Of that: coniferous		30	4	7	4 995	1	7
16	Broadleaved		19	4	8	8	4	3
17	Sale of timber together		5 070	3 708	4 345	6 194	3 704	3 728
18	Of that: coniferous		2 723	1 644	2 271	4 127	1 841	1 852
19	Broadleaved		2 347	2 064	2 074	2 067	1 863	1 875
20	Stumpage sale (of line 17)		60	82	29	683	3	3
21	Of that: coniferous		25	14	21	678	2	1
22	Broadleaved		35	69	8	5	1	2
23	Sale of timber in domestic market together		4 720	3 339	3 939	5 616	3 616	3 635
24	Of that: coniferous		2 531	1 550	2 071	3 684	1 806	1 822
25	Broadleaved		2 189	1 789	1 868	1 932	1 810	1 813
26	Timber export of line 17*		350	369	406	577	88	93
27	Of that: coniferous	Ths m <sup>3</sup>	192	94	200	442	35	31
28	Broadleaved		158	275	206	135	53	62
29	Investment together	Mill SKK	553	432	372	807	662	635
30	Of that: construction works		279	223	170	363	221	297
31	Machines and equipment		274	209	195	387	288	283
32	Other**		0	0	7	57	153	55
33	Length of forest roads to 31 December	Km	20 547	9 940	9 942	9 945	9 949	9 952
34	Length of skidding roads to 31 December		14 937	7 678	7 680	7 683	7 688	7 700
35	Length of streams in own administration		19 715	19 715	19 159	18 746	16 904	15 202
36	Area of managed forest lands	Ths ha	1 976	1 232	1 191	1 174	1 172	1 171
37	Staff in economic domain	Persons	36 316	11 478	8 288	6 836	6 266	6 144
38	Of those: workers		25 536	7 568	4 663	3 406	2 891	2 799
39	Average monthly earnings	SKK	3 419	13 702	16 857	19 040	21 290	22 298

Note: \*Export under the own title of forest owner (user); \*\*For example, elaboration of the forest management plan, other intangible property; \*\*\*Including extraordinary felling; \*\*\*\*Including proportional part of regeneration from the state administration decision and change in forest stands use



Table 5 Basic financial indicators of state forest organizations under the Ministry of Agriculture of the SR

No.	Indicator	Measurement unit	Actual state in year				Assumption for 2006	Expectation for 2007
			1990	2003	2004	2005		
1	Sales and revenues	Mill SKK	4 179	5 783	6 583	8 700	6 500	6 480
2	Timber returns		2 301	4 409	5 250	7 021	4 513	4 670
3	Other sales and revenues		884	1 242	1 236	1 675	1 987	1 810
4	Direct costs of silvicultural operations		511	580	586	828	671	645
5	Direct costs of logging operations		607	2 469	2 533	3 766	2 999	3 014
6	Total costs of silvicultural operations		776	822	814	1 066	881	836
7	Total costs of logging operations		970	3 361	3 435	4 544	3 778	3 792
8	Production costs together		4 016	6 362	6 121	8 483	6 357	6 458
9	Material costs including depreciation		1 853	2 854	3 212	3 476	3 547	3 543
10	Depreciation		557	395	378	394	396	394
11	Personal costs	Mill SKK	1 928	2 356	2 204	2 636*	2 062	2 075
12	Of that: labour costs		1 397	1 656	1 592	1 910	1 477	1 492
13	Economic result (profit, loss)		163	-579	462	217	143	22
14	Subsidies together		1 101	165	123	111	63	121
15	Of that: Subsidies for forest operations		994	77	6	4	0	0
16	Subsidies for investments			33	26	27	12	50
17	Subsidies for other operations		107	55	91	80	51	71
18	Claims after the term of maturity		105	715	17	541	527	507
19	Liabilities after the term of maturity to 31 December		10	43	26	17	1	1

\*Including price of works secured by subjects providing services

Table 6 Main economic indicators of state forest organizations under the Ministry of Agriculture of the Slovak Republic

No.	Indicator	Measurement unit	Actual state in year				Assumption for 2006	Expectation for 2007
			1990	2003	2004	2005		
1	Forest regeneration together	Ha	17 497	8 006	7 948	7 182	6 352	6 415
2	Of that: artificial forest regeneration		14 308	5 041	4 595	4 597****	4 458	4 375
3	Treatment of young stands		14 084	6 877	7 376	7 934	1 373	1 320
4	Protection of young forest stands		136 220	34 187	34 061	33 553	36 206	37 946
5	Forest protection (direct costs)	Ths SKK	41 000	61 154	64 286	88 247	84 957	80 543
6	Cleaning	Ha	30 775	19 126	18 379	17 431	17 065	17 100
7	Thinning		35 384	36 514	31 590	25 005	29 789	30 800

Table 6 – contd.

No.	Indicator	Meas- urement unit	Actual state in year				As- sumption for 2006	Ex- pectation for 2007
			1990	2003	2004	2005		
8	Timber felling together	Ths m <sup>3</sup>	4 800	3 589	3 923	6 125***	3 677	3 709
9	Of that: coniferous		2 501	1 651	1 979	4 222	1 866	1 854
10	Broadleaved		2 299	1 938	1 944	1 903	1 811	1 855
11	Incidental felling together (of line 8)		2 415	1 301	1 484	4 234	1 219	1 220
12	Of that: coniferous		1 572	1 113	1 281	4 005	1 123	1 170
13	Broadleaved		843	188	203	229	96	50
14	Buying timber together		49	8	10	5 003	5	10
15	Of that: coniferous		30	4	5	4 995	1	7
16	Broadleaved		19	4	5	8	4	3
17	Sale of timber together	Ths m <sup>3</sup>	4 732	3 345	3 955	5 707	3 354	3 379
18	Of that: coniferous		2 490	1 456	2 065	3 885	1 662	1 674
19	Broadleaved		2 242	1 889	1 890	1 822	1 692	1 705
20	Stumpage sale (of line 17)		60	73	17	675	1	1
21	Of that: coniferous		25	9	13	672	0	0
22	Broadleaved		35	64	4	3	1	1
23	Sale of timber in domestic market together		4 398	3 006	3 575	5 152	3 268	3 288
24	Of that: coniferous		2 307	1 381	1 885	3 459	1 627	1 644
25	Broadleaved		2 091	1 625	1 690	1 693	1 641	1 644
26	Timber export (of line 17)*	Mill SKK	334	339	380	555	86	91
27	Of that: coniferous		183	75	180	426	35	30
28	Broadleaved		151	264	200	129	51	61
29	Investment together		541	367	311	615	587	553
30	Of that: construction works		274	189	130	243	194	270
31	Machines and equipment		267	178	174	325	240	228
32	Other**				7	47	153	55
33	Length of forest roads to 31 December	Km	18 672	9 153	8 963	8 970	8 974	8 977
34	Length of skidding roads to 31 December		13 474	7 068	6 972	6 975	6 980	6 991
35	Length of streams in own administration		18 467	18 467	18 467	18 054	16 212	14 510
36	Area of managed forest lands	Ths ha	1 829	1 147	1 105	1 090	1 088	1 087
37	Staff in economic domain	Persons	33 693	10 410	7 394	6 212	5 659	5 595
38	Of those: workers		23 700	6 864	4 103	3 069	2 569	2 525
39	Average monthly earnings	SKK	3 456	13 609	16 993	19 051	21 355	22 348

Note: \*Export under the own title of forest owner (user); \*\*For example, elaboration of the forest management plan, other intangible property; \*\*\*Including extraordinary felling; \*\*\*\*Including proportional part of regeneration from the state administration decision and change in forest stands use

*Table 7 Basic financial indicators of state forest organizations for the Ministry of Defence of the Slovak Republic and for vocational schools\*\*\**

No.	Indicator	Measurement unit	Actual state in				Assumption for 2006	Expectation for 2007
			1990	2003	2004	2005		
1	Sales and revenues	Mill SKK	352	641	840	1 008	828	807
2	Timber returns		303	414	518	614	430	426
3	Other sales and revenues		36	166	265	384	383	366
4	Direct costs of silvicultural operations		54	51	53	46	61	64
5	Direct costs of logging operations		309	205	179	187	163	165
6	Total costs of silvicultural operations			91	63	71	65	68
7	Total costs of logging operations			351	202	208	181	183
8	Production costs together	Mill SKK	310	671	811	858	812	804
9	Material costs including depreciation		123	175	168	173	164	167
10	Depreciation		39	67	67	80	71	72
11	Personal costs		128	274	265	205	203	189
12	Of that: labour costs		93	190	172	138	144	144
13	Economic result (profit, loss)		42	-30	29	150	16	3
14	Subsidies together		14	61	57	61	50	44
15	Of that: Subsidies for forest operations		13	15	10	10	10	7
16	Subsidies for investments		1	0	0	3	5	2
17	Subsidies for other operations			46	47	48	35	35
18	Receivables after the term of maturity		0	74	86	85	82	76
19	Liabilities after the term of maturity to 31 December		0	0	0	0	0	0

\*\*\*Until 2004 mentioned as Basic financial indicators of state forest organizations within the competence of the sectors except for the Ministry of Agriculture of the Slovak Republic

*Table 8 economic indicators of state forest organizations for the Ministry of Defence of the Slovak Republic and for vocational schools\*\*\**

No.	Indicator	Measurement unit	Actual state in the year				Assumption for 2006	Expectation for 2007
			1990	2003	2004	2005		
1	Forest regeneration together	Ha	1 467	668	798	877	767	719
2	Of that: artificial forest regeneration		1 192	549	680	658	620	568
3	Treatment of young stands		2 884	70	132	84	145	114
4	Protection of young forest stands		5 700	1 999	2 405	2 910	2 879	2 667
5	Forest protection (direct costs)	Ths SKK	54 000	1 840	2 245	2 578	2 286	2 302
6	Cleaning	Ha	3 368	1 108	1 915	2 133	1 921	1 738
7	Thinning		1 759	2 733	2 613	2 251	2 643	2 433

Table 8 – contd.

No.	Indicator	Meas- urement unit	Actual state in the year				As- sumption for 2006	Ex- pectation for 2007
			1990	2003	2004	2005		
8	Timber felling together	Ths m <sup>3</sup>	476	360	386	382****	353	351
9	Of that: coniferous		276	156	204	213	181	180
10	Broadleaved		200	204	182	169	172	171
11	Incidental felling together (of line 8)		196	120	115	122	93	93
12	Of that: coniferous		154	103	103	110	82	81
13	Broadleaved		42	17	12	12	11	11
14	Buying timber together		0	0	5	0	0	0
15	Of that: coniferous		0	0	2	0	0	0
16	Broadleaved		0	0	3	0	0	0
17	Sale of timber together		338	363	390	487	350	349
18	Of that: coniferous		233	188	206	242	179	178
19	Broadleaved		105	175	184	245	171	170
20	Stumpage sale (of line 17)		0	9	12	8	2	2
21	Of that: coniferous		0	5	8	6	2	1
22	Broadleaved		0	5	4	2	0	1
23	Sale of timber in domestic market together		322	333	364	464	348	347
24	Of that: coniferous		224	169	186	225	179	178
25	Broadleaved		98	164	178	239	169	169
26	Timber export (of line 17)*		16	30	26	22	2	2
27	Of that: coniferous		9	19	20	16	0	1
28	Broadleaved		7	11	6	6	2	1
29	Investment together	Mill SKK	12	65	61	192	75	82
30	Of that: construction works		5	34	40	120	27	27
31	Machines and equipment		7	31	21	62	48	55
32	Other**					10		
33	Length of forest roads to 31 December	Km	1 875	787	979	975	975	975
34	Length of skidding roads to 31 December		1 463	610	708	708	708	709
35	Length of streams in own administration		1 248	1 248	692	692	692	692
36	Area of managed forest lands	Ths ha	147	85	86	84	84	84
37	Staff in economic domain	Persons	2 623	1 068	894	624	607	549
38	Of those: workers		1 836	704	560	337	322	274
39	Average monthly earnings	SKK	2 944	14 613	15 732	18 928	20 685	21 784

Note: \*Export under the own title of forest owner (user); \*\*For example, elaboration of the forest management plan, other intangible property; \*\*\*Until 2004 mentioned as Basic financial indicators of state forest organizations within the competence of the sectors except for the Ministry of Agriculture of the Slovak Republic; \*\*\*\*Including extraordinary felling



Table 9 Basic financial indicators of the non-state forests of the Slovak Republic

No.	Indicator	Measurement unit	Actual state in year				Assumption for 2006	Expectation for 2007
			1993	2003*	2004	2005		
1	Sales and revenues	Mill SKK	1 288	4 131	4 061	4 071	3 920	3 875
2	Timber returns		990	3 532	3 700	3 720	3 500	3 400
3	Other sales and revenues		187	470	350	340	400	450
4	Direct costs of silvicultural operations		245	607	608	602	610	620
5	Direct costs of logging operations		423	1 420	1 562	1 750	1 800	1 850
6	Total costs of silvicultural operations		318	820	848	753	800	850
7	Total costs of logging operations		614	2 085	2 290	2 411	2 500	2 550
8	Production costs together		1 258	3 795	3 700	3 720	3 650	3 600
9	Material costs including depreciation		353	1 520	1 480	1 490	1 500	1 550
10	Depreciation		109	380	375	360	350	340
11	Personal costs		546	1 201	1 209	1 334	1 310	1 340
12	Of that: labour costs		396	870	876	937	950	970
13	Economic result (profit, loss)		30	336	361	351	270	275
14	Subsidies together		111	129	45	26	270	65
15	Of that: Subsidies for forest operations		111	129	11	11	20	25
16	Subsidies for investments		—	—	34	15	35	40
17	Subsidies for the other operations		—	—	—	—	215	—
18	Receivables after the term of maturity		296	200	150	120	100	100
19	Liabilities after the term of maturity to 31 December		123	60	50	50	50	50

*\*\*Since 2003 the price of work of forest owners and users and their family members is included within the production costs*

Table 10 Main economic indicators of the non-state forests of the Slovak Republic

No.	Indicator	Measurement unit	Actual state in year				Assumption for 2006	Expectation for 2007
			1993	2003	2004	2005		
1	Forest regeneration together	Ha	1 924	5 365	5 214	5 445	6 500	5 800
2	Of that: artificial forest regeneration		1 766	4 035	3 591	3 667****	4 700	4 200
3	Treatment of young forest stands		870	4 241	3 277	3 364	4 200	4 500
4	Protection of young forest stands		12 295	32 186	30 200	29 252	32 200	32 800
5	Forest protection (direct costs)	Ths SKK	41 000	39 485	45 298	46 070	47 000	49 000
6	Cleaning	Ha	5 480	11 930	10 021	9 514	10 100	10 200
7	Thinning		7 145	20 488	21 779	18 816	21 600	21 400
8	Timber felling together	Ths m <sup>3</sup>	966	2 703	2 964	3 683***	3 300	3 000

Table 10 – contd.

No.	Indicator	Measurement unit	Actual state in year				Assumption for 2006	Expectation for 2007
			1993	2003	2004	2005		
9	Of that: coniferous	Ths m <sup>3</sup>	491	1 701	1 821	2 492	2 200	1 900
10	Broadleaved		475	1 002	1 143	1 191	1 100	1 100
11	Incidental felling together (of line 8)		409	1 325	1 317	2 177	1 800	1 300
12	Of that: coniferous		358	1 219	1 171	2 038	1 700	1 100
13	Broadleaved		51	106	146	139	100	200
14	Buying timber together		0	110	120	160	140	130
15	Of that: coniferous		0	50	50	70	60	50
16	Broadleaved		0	60	70	90	80	80
17	Sale of timber together		929	2 549	2 853	3 093	3 000	2 800
18	Of that: coniferous		484	1 656	1 745	2 102	1 900	1 800
19	Broadleaved		445	893	1 108	991	1 100	1 000
20	Stumpage sale (of line 17)		100	54	68	100	90	80
21	Of that: coniferous		65	40	50	70	60	50
22	Broadleaved		35	14	18	30	30	30
23	Sale of timber in domestic market together		802	2 035	2 656	2 889	2 800	2 600
24	Of that: coniferous		394	1 396	1 631	1 926	1 700	1 500
25	Broadleaved		408	639	1 025	963	1 100	1 100
26	Timber export (of line 17)*		127	514	197	204	200	200
27	Of that: coniferous		90	260	114	177	150	150
28	Broadleaved		37	254	83	27	50	50
29	Investment together	Mill SKK	71	150	142	125	140	145
30	Of that: construction works		51	55	50	40	50	55
31	Machines and equipment		20	95	80	75	75	80
32	Other**		—	—	12	10	15	10
33	Length of forest roads to 31 December	Km	7 249	11 246	11 247	11 248	11 249	11 250
34	Length of skidding roads to 31 December		3 108	8 205	8 207	8 209	8 211	8 213
35	Length of streams in own administration		0	0	0	0	0	0
36	Area of managed forest lands	Ths ha	430	772	815	832	834	836
37	Staff in economic domain	Persons	5 900	6 600	6 580	6 560	6 600	6 600
38	Of those: workers		4 350	4 880	4 860	4 840	4 800	4 800
39	Average monthly earnings	SKK	5 600	10 990	11 100	11 900	12 500	13 000

Note: \*Export under the own title of forest owner (user); \*\*For example, elaboration of the forest management plan, other intangible property; \*\*\*Including extraordinary felling; \*\*\*\*Including proportional part of regeneration from the state administration decision and change in forest stands use

Source of information in all Tables (1–10): Permanent Forest Inventory 2005, Reports on Forestry in the Slovak Republic, Special questionnaire from forest owners and users, Sectoral statistical records of the Ministry of Agriculture of SR: Les V 5–01, Les F 7–01, Les V 1–04, Les D 2–04, Les P 6–01, Uč POD 1–01, Uč POD 2–01

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