

REPORT ON THE STATUS OF FORESTRY IN THE SLOVAK REPUBLIC 2007
GREEN REPORT



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Bratislava, August 2007

Ministry of Agriculture of the Slovak Republic

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2007

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FOREWORD

Dear readers,

The honour has been passed down on me again to introduce the 15th 2007 Report on the State of Forestry in the Slovak Republic, better known as the Green Report. The report evaluates the most recent developments in Slovak forestry and provides a wide range of economic, social and environmental data associated with the sector. As in previous years, the report is indicative of developmental trends allowing us to assess the nature and appropriateness of measures aimed at sustainable management of forest resources.

Slovak forests represent natural heritage that reflects long-term status and development of society in the national, European and global context. Present diversity of life forms and forest ecosystems would be gone without centuries of hard work of many generations of foresters who systematically protected, improved and managed local forests. In the 18th century, forestry belonged to one of the first industries to acknowledge the importance of regular management practices. Two hundred years on, the efforts of generations of foresters have paid back in the increase of forest area and growing stock available in Slovak forests. International recognition of the achievements of Slovak forestry and quality of forest production has ranked it among leading forestry countries in Europe.

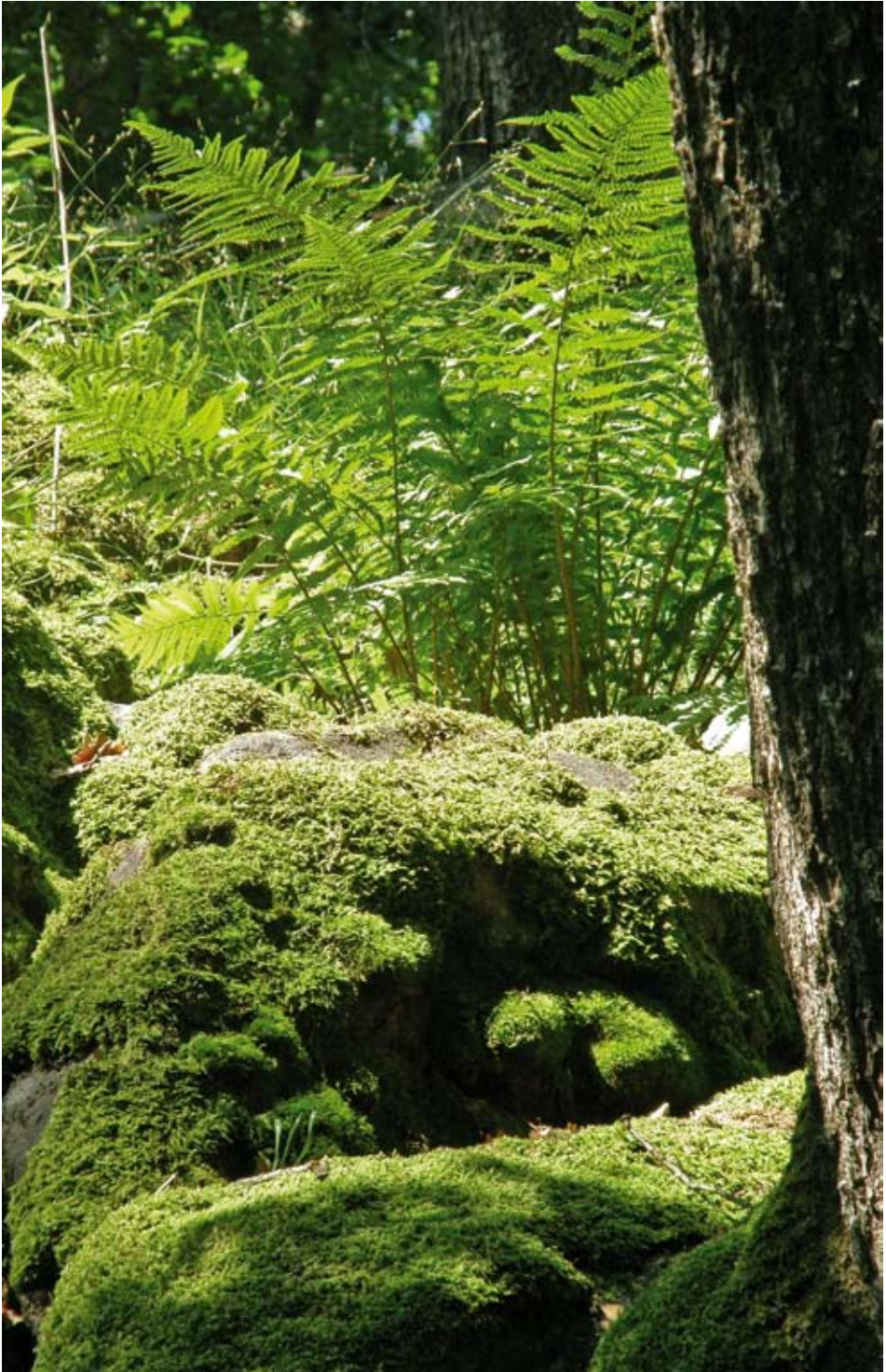
Recently, forests in Slovakia have suffered under the influence of climate change associated phenomena. This fact resulted in a growing number of calamitous windthrow events affecting our forests. At the same time, these events have brought into the attention of forestry professionals the need for the immediate solution of principal issues associated with contemporary forestry and nature conservation. The objective is very simple: to achieve sustainable exploitation of natural resources and protection of national natural heritage amassed by generations of our forefathers.

Current condition of Slovak forests, plagued by the growing incidence of salvage felling induced by detrimental impact of abiotic and biotic agents calls for the immediate implementation of effective management measures contributing to the improved stability and resilience of forest ecosystems. We are living the period that is very testing not only for the forestry sector, but also for the sector of nature conservation and it is to the credit of both sectors that they recently have managed to find a common speech to deal with current forestry issues for the benefit of both forestry and nature conservation. The report highlights a number of issues which clearly support the fact that forest managers at present primarily focus on the preservation of the existing forest biodiversity and the fulfilment of all forest functions in order to satisfy multiple needs of the contemporary society. Most importantly, they strive in their efforts to secure rightful needs of future generations.

I trust that the Green Report you are presented with will give you a good reason to believe that Slovak forests are at present in the competent hands of well-qualified forestry professionals. At the same time, I hope that the report will provide you with all data you might need for your work.

A handwritten signature in blue ink, appearing to read 'Jureňa', with a large, stylized loop on the left side.

Miroslav Jureňa
Minister of Agriculture



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1. INTRODUCTION

1.1. General overview of Slovak forest sector

In 2006, the area of forests in Slovakia reached 2,007 thousand hectares. At the same time, the total area of forest crop land reached 1,932 thousand hectares with both metrics being on a long-range increase. Forest cover calculated as the total forest plot-country area ratio was estimated at 41 percent.

Due to an intensifying pressure on the fulfilment of social forest functions the area of commercial forests gradually decreases with current percent standing at 67.5. The reversed trend is observed in the category of protection (17 percent) and special-purpose (15.5 percent) forests whose primary role is to fulfil a range of ecological and social functions. The area of these forests has been steadily increasing.

Preferences in forest species composition are long-term given to multi-species forest stands as rich biodiversity reinforces static and ecological balance of forest ecosystems. As for the classification of forests by main species groups, conifers account for 30.8 percent, broadleaves for 49.7 percent, and mixed forests for the remaining 18.9 percent of Slovak forests.

Forest ecosystems represent the dominant and exceptionally valuable component of protected areas. At present, forests in protected areas cover an estimated 1,134.94 thousand hectares. They include forests in buffer zones and in total form 23.1 percent of the Slovak territory. Total forest cover of the protected areas under the 2–5th level of protection is an estimated 72.6 percent. At present, there are 9 national parks, 14 protected landscape areas and 703 small-scale protected areas designated nationwide.

In co-operative efforts with the European Commission, the process of designation of the national network of Natura 2000 *Sites of Community Importance* (SCI) and *Special Protection Areas* (SPA) has come under way. Upon the designation process completion, the area of protected areas is projected to further increase. From the global and European point of view, the protected area-national territory rate as well as the protected area - total forest area rate are both well above standard for respective regions. It is possible to say that from the economic point of view, the area of protected forests topped by various management restrictions applied in forests long-term exceeds actual potential of national economy.

The growing stock in Slovak forests has been on a steady increase and in 2006 reached an estimated 443.8 million m³ of timber above 7cm inside bark. The average volume of growing stock per hectare is 231 m³. A continuing increase in the growing stock volume is attributed to a number of factors including: above normal presence of 50–100-year forest stands; more accurate methods of growing stock estimate based on new yield tables; other still largely unspecified factors.

Reported annual felling volumes have also been on increase. Most recent statistical figures have shown a rather dramatic rise in the available growing stock from 6.2 million m³ in 2000 through more than 6.6 million m³ in 2003 and more than 7.2 million m³ in 2004 to 10.2 million m³ in 2005. The 2005 felling was entered in forest sector books as record yearly felling volume in the industry's history. The record volume was a direct result of disastrous windthrow from November 2004. The 2006 felling volume figures stopped



Figure 1 Forests fulfil important ecological, social and economic functions

at 8.3 million m³. Owing to large extent of incidental felling experienced in recent years, the annual allowable cut prescribed in valid forest management plans (FMPs) was before 2004 exceeded by as much as 11 percent on average.

The increasing felling volumes are best mirrored in an improved income and economic performance of the forest sector. Yet at the same time, they seriously compromise future felling potential. The high rate of incidental felling is also sustained by deteriorating forest health undermined by air pollution. The decline is particularly noticeable in coniferous forests dominated by spruce.

The total area of regenerated forest (natural and planting combined) has been steadily decreasing. Recent preferences for the implementation of shelterwood silvicultural system have found reflection in the increased rate of natural regeneration (from less than 10 percent between 1991–2000 to 33.9 percent in 2005 and 40.5 percent in 2006).

The total volume of protection and treatment of young forest has been decreasing. The main reason behind this promising fact is the growing rate of natural regeneration. The volume of realised cleaning has in non-state forests fallen in 2004–2006 to 70 percent of the prescribed area. In state forests, the trend is quite opposite with the annual prescribed volume being exceeded. The actual area of thinning is likewise on decrease; this fact is primarily caused by the postponement of planned thinning due to large volumes of incidental felling in mature and intermediate forest stands. Due to this fact, the volume of actual intermediate felling is long-term higher than planned. The most critical situation is experienced in coniferous stands which account for more than 90 percent of the intermediate incidental felling.

The gross part of the forest industry income is generated from timber sale, which secures around 80 percent of the industry's earnings and revenue. Timber export figures have shown a steady decline since 2000, the only exception being the year 2005. This anomaly was caused by salvage of timber from the 2004 disastrous windthrow.

In order to improve employment and income figures, there are ongoing efforts to increase the volume of timber processed by domestic producers. This trend has been well documented by the average statistical figures which have shown a gradual increase in the production and consumption of basic log grades in m³ per capita. On the other hand, however, efforts to increase the added value of timber based products are largely failing.

Cooperation links between forest and wood processing sectors are based on professional approach to trading and partnership. The pulp-paper industry is considered the most stable branch of the latter mentioned. Thanks to a continually increasing capacity of the wood industry this is able to absorb larger volumes of timber. In the near future, increased concentration of sawmill production and state-of-the-art saw timber production is largely expected.

In the European context, Slovak forest sector has become competitive in terms of available timber market conditions, social forest functions and sectoral *know-how*. Efforts must continue to reinforce the principles of ecological-economic sustainability of the industry and its increased effectiveness.

The comparison of economic results of forest sector state-run organizations expressed in common prices shown firstly the decrease in 1990–2004 followed by an increase from 2004 onwards. In non-state forests, the economic result of organizations is continually improving.

Public subsidies into particular sectors of national economy have been steadily falling with the most distinct slump recorded in 2004–2005. In 2006, the subsidies reached the level of 2003.

The rate of the forest sector's contribution to the national macro-economic result represented 0.52 percent. The appreciation of the domestic marketable timber in the wood processing sector accounted for an estimated 21.5 billion SKK, i.e. 1.3 percent of the gross domestic product (GDP). The rate of forest and wood processing sectors' contribution including benefits derived from environmental, cultural and social forest functions is estimated to reach 2.92 percent of GDP in 2006.

The process of reinstatement of original ownership rights is still pending completion. The largest share of still unsettled ownership rights is in the category of small private forests (only 44 percent of these forests have been resolved). The completion of this process is impossible without prior elimination of regulatory, technical and economic barriers.

1.2. Selected indicators of global and European forestry

1.2.1. Global forest resources

Global forests account for an estimated 30 percent of the Earth's dry land mass. The total forest area is estimated to be almost 4 billion hectares but the area of forest is unevenly distributed. 43 countries of the world enjoy forest cover of more than 50 percent; on the

opposite end of the scale, there are 64 countries with cover below 10 percent. Over a half of the entire global forest resource is situated in no more than 5 countries – the Russian Federation, Brazil, Canada, the USA and China.

Future of world forests is under serious threat from an alarming rate of global deforestation. Some 13 million hectares of forest disappear each year. This loss is only partially offset by forest planting and natural expansion of forests. Despite this fact, net global change in forest area in the period 2000–2005 is estimated at -7.3 million hectares (0.18 percent) of global resource per year. In country files for 2000 onwards, 57 countries have reported an increase in forest cover. On the contrary, 83 countries worldwide reported a forest cover decrease with 36 countries reporting a loss of more than 1 percent per year.

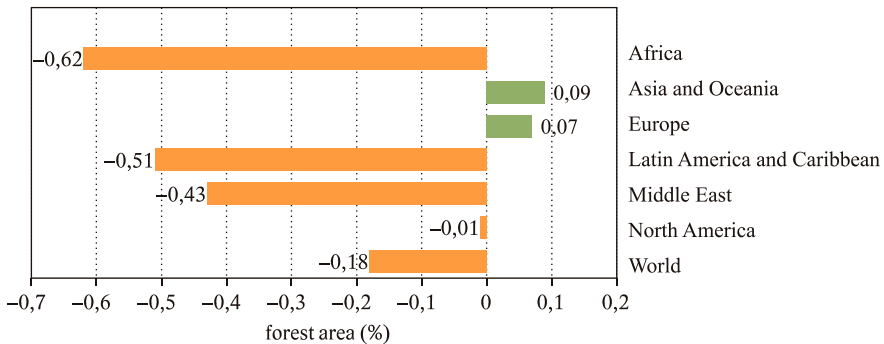


Figure 1.2.1–1 Average annual change in forest area 2000–2005

Source: State of the World's Forests, FAO 2007

The global forest biomass has fallen by 5.5 percent over the past 15 years. Observations confirm that regional trends in general reflect forest area changes. As for carbon in forest biomass, this has increased in Europe and North America, but decreased in most tropical regions of the world.

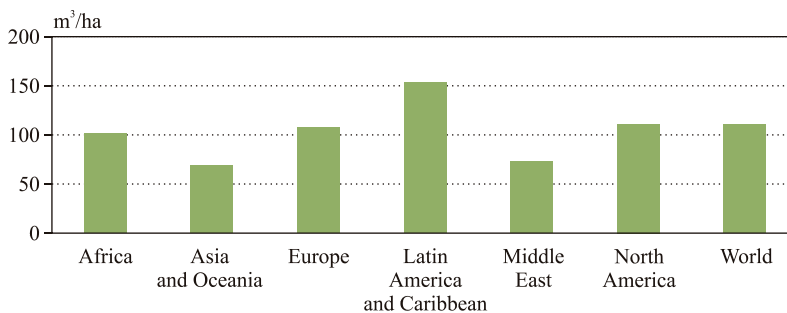


Figure 1.2.1–2 Average timber growing stock per ha 2005

Source: State of the World's Forests, FAO 2007

In 2005, globally, more than 11 percent of total forest area were designated for the conservation of biological diversity as the primary function. It is estimated that 36 percent of world's forests can be considered natural, i.e. formed by native tree species, void of any visible human intervention and with ecological processes without significant disturbance. Majority of these forests are situated in Latin America and the Caribbean (75 percent).

They are well represented in the countries of North America (45 percent). Each year, an estimated 6 million hectares of these forests is being lost or converted to biologically less valuable forests. This trend is most evident in Indonesia (13 percent over past 5 years), Mexico (6 percent), Papua and New Guinea (5 percent), and Brazil (4 percent). The trend is chiefly attributed to pressures from growing populations, increasing agricultural production, poverty growth and commercial exploitation of tropical forests.

Majority of countries lack reliable data on forest area damaged by fire, insect, diseases and other harmful agents. It is estimated that only about 20 countries worldwide, majority of which are in Europe and include Slovakia, are able to provide credible data on the state and

development of their national forest resource. Each year, an estimated 5 percent of world's forests is damaged by forest fires.

Statistics for 2005 put the area of timber production forests at 50 percent of the global forest resource, of which in 34 percent of these forests this function is considered primary. In the past 15 years, the area of these forests has been reduced by 5 percent.

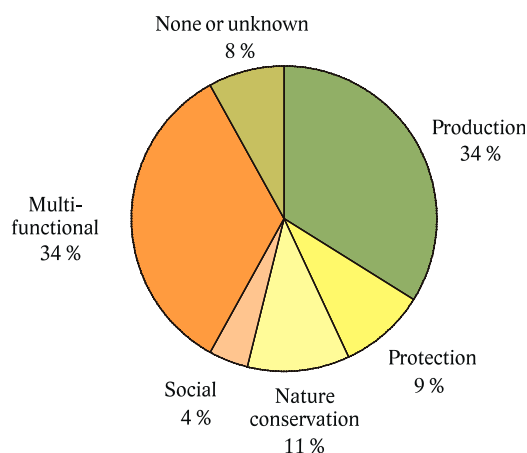


Figure 1.2.1–3 Distribution of global forest area by prevalent function

Source: State of the World's Forests, FAO 2007

On a global scale, trends in overall timber trade balance indicate that Europe has become the largest exporting and importing region in the world showing positive timber export balance continually since 2001. The trend is quite opposite in North America, where since the mid 1990s the value of timber import has significantly topped its total export value.

Forest sector employment (including WPI) has increased by 4 percent in the period 1990–2000. At the same time, the added value grew only marginally by 1 percent. Timber trade, one of the main sources of forest sector revenue, is an important source of economic growth, particularly in developing countries of the world. Timber export for the period given above increased in developing countries by almost 50 percent. An estimated 4 percent of world's forests are managed for social services such as recreation, education, and tourism with Europe leading the table.

1.2.2. European forestry (excluding the Russian Federation)

In 2005, forests in Europe covered an estimated 193 million hectares which represented an increase of almost 7 percent compared to 1990. This positive trend also reflects ambitions of European countries to manage their forest resources in a sustainable way. No other region of the world than Europe has recorded a steady increase in forest area over the last 15 years (in Asia, forest area has grown primarily due to large-scale afforestation efforts in China).

As for conservation of forest biodiversity, this has become a major challenge particularly in Europe since majority of European forest area has gone through a number of drastic changes induced by humankind. Although natural forests account for only 4 percent of the European territory, forest area designated for biodiversity conservation has increased more than threefold over the past 15 years (from 6.6 million hectares to 20.3 million hectares). Each year, an estimated 6 percent of European forests (10.9 million hectares) is to a various degree damaged by harmful agents.

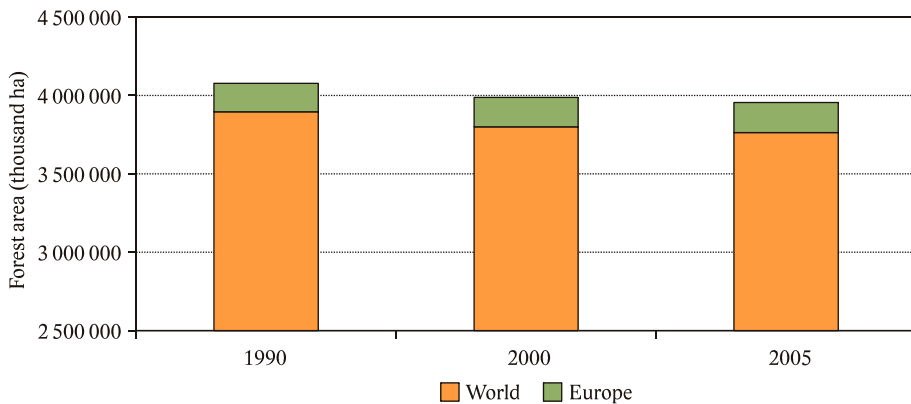


Figure 1.2.2–1 Trends in forest area
Source: State of the World's Forests, FAO 2007

73 percent of European forest area is primarily managed for timber production. Both total growing stock (26.8 billion m³) and stock per hectare (141 m³) is on increase and even reaching historical levels in many countries of the region; this is particularly true for the countries of Central Europe. Since 1990, total felling volume has grown by an estimated 21 percent to reach 490 million m³ in 2005. Although European forests account for only 5 percent of the global forest area they produce no less than 23 percent of the world's industrial roundwood. This trend, nevertheless, is not in a sharp conflict with current efforts for sustainable exploitation of forest resources since both the area and growing stock are continually growing and felling volumes are below annual increment levels.

Total value of forest products has been on increase in pretty much the entire region with countries of Central and Eastern Europe experiencing a considerably faster growth than the rest of the region. Gross added value of roundwood production was only 16 percent compared to 34 percent in wood processing industry and 50 percent in pulp and paper industry. As for forest sector employment, this has been in decline since productivity currently outpaces average production rates. Similarly, a long-term decrease of sectoral contribution to gross domestic product is being observed. This fact has directly been attributed to growing levels of GDP contribution from other sectors and services of the national economy.

1.3. Forest policy priorities and objectives

1.3.1. The Concept of Agrarian Development 2007–2013 (CAD) – chapter Forestry (CADF)

The draft version of CAD has been compiled in line with the priorities and objectives of the forest sector defined in the country agricultural policy based on relevant national and the EU documents as well as a number of international agreements and conventions. The document is also consistent with the baseline documents of the EU Forest Action Plan identifying fundamental strategic objectives and priorities of the agricultural sector for 2013 mid-term horizon.

The guiding objective of the forest sector as defined in CADF is to ***"ensure sustainable management of forests based on sound exploitation of their economic, environmental and social functions and services for the benefits of the entire society and rural communities in particular."***

The key objectives of the conception include:

- ***enhancement of economic competitiveness of multifunctional forestry and sustainable exploitation of forest products, goods and services (economic objective);***
- ***enhancement of forest health, vitality and resilience of forest ecosystems and their biological diversity (environmental objective);***
- ***enhancement of the contribution of forests and forestry to the quality of life through preservation and improvement of social and cultural aspects of forests (social objective).***

CADF sets up priorities for the three specified objectives (economic, environmental and social) and actions to achieve them. At the beginning of 2007, CADF was further detailed to contain exact tasks to provide a realistic response to most contemporary needs of the sector which at present operates in difficult economic and financial conditions given by a growing number of restrictions applied in forests and increasing societal pressures on the provision of non-production forest functions in the climate of insufficient financial compensation for such services.

1.3.2. The National Forest Programme (NFP)

The draft version of nfp was drawn in 2006. Upon its completion, it was in 2007 submitted to the National Assembly of the Slovak Republic for its final approval. The document answers to all main forestry related political documents on both national and international level including:

- EU Forestry Strategy;
- EU Forest Action Plan;
- CADF;
- resolutions of the Ministerial Conferences on the Protection of Forests in Europe (MCPFE);
- global initiatives on forests including the United Nations Forum on Forests (UNFF);

- other international agreements, such as the Convention on Biological Diversity (CBD);
- United Nations Framework Convention on Climate Change (UN FCCC);
- Kyoto Protocol;
- other processes and initiatives.

Based on the aforementioned documents and processes, nfp further formulates and updates priorities of the forest sector, provides framework for the intervention of other sectors in the formulation of forestry policy, pays attention to the enhancement of public awareness about forests and their role in the society, provides platform for active involvement of governmental and non-governmental stakeholder groups in forestry related issues. In addition, it provides a common ground for solving controversial issues under jurisdiction of different governmental agencies. The programme also lists five strategic objectives of the sector. They are:

1. to promote ecological forest management;
2. to improve and protect the environment;
3. to contribute to the quality of life;
4. to improve long-term sectoral competitiveness;
5. to foster coo-operation, coordination and communication.

These objectives were further elaborated into 18 thematic priority areas and 55 framework goals. The objectives of the programme are to be achieved through a special action plan which will be available in 2008. The timescale for the nfp completion is set for the end of 2020. The document was submitted to the Slovak Government for approval in April 2007 and at present it is pending consultation in the Slovak National Council.

The NFP emphasises the principle of sustainable forest management actively supported by state forestry policy in the area of public interest and enhanced responsibility of forest owners for the management of their properties. It assumes development of a system of public compensation for protective, ecological, environmental and other social functions and services provided by forests.

1.3.3. Financing and envisaged benefits of the Concept of Agrarian Development – chapter Forestry and NFP

Financial aspects of CADF and NFP execution are defined by the financial framework of the EU's financial perspective for 2007–2013 and national implementation of Regulation (EC) No 1290/2005 on the financing of the common agricultural policy and Regulation (EC) No 1698/2005 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD). EAFRD funding opportunities at a national level are given in the *National Strategic Plan of Rural Development 2007–2013* approved by the Slovak Government in Decree No 1016/2006 and the *Rural Development Programme 2007–2013*.

In the ongoing programming period 2007–2013, the state subsidies into forestry are to be managed through the *Sustainable Forest Sector Programme*. Financial resources allocated

under this programme shall be distributed for projects within the following thematic sub-programmes: the *Revitalisation and Development of Forest Sector* and the *Research and Expertise for Sustainable Forest Sector*. State funding will be granted consistent with the EU rules and Act No 274/2006 Coll on support for agriculture and rural development.

Lastly, additional funding for the implementation of conception objectives shall be provided from the internal sources of forest owners and managers, other EU funds and respective Sectoral Operational Programmes (SOP) depending on the nature of particular measures (LIFE+, FP7, Intelligent Energy for Europe, other EU programmes focusing on the enhancement of competitiveness, innovation, education and training).

Sufficient funding made available for nfp and CADF will:

- contribute to reinforcement of multifunctional forestry and improve provision of economic, ecological, social and cultural functions of forests;
- contribute to improved access to renewable, environmentally friendly raw materials;
- strengthen position of forestry in economic development, employment and prosperity of the country and its particular, primarily rural, regions;
- increase positive contribution of forests to the quality of life, especially with regard to the quality of the environment, recreation potential, preventive health care and protection of aesthetic landscape values;
- enhance ecological landscape values;
- improve protection of infrastructure against natural elements, particularly with respect to increasing incidence of natural catastrophes, extreme weather situations and soil erosion.

1.4. Regulatory framework

The following generally binding legal norms regulating forestry issues were approved and came into effect in 2006:

1. Government Decree No 245/2006 Coll adapting and amending Government Decree No 199/2005 Coll on protection measures against introduction and distribution of organisms harmful to plants or plant products.
2. MA SR Regulation No 232/2006 Coll on harvest marking, felled timber marking and timber origin documentation.
3. Act No 274/2006 Coll on support for agriculture and rural development.
4. MA SR Regulation No 397/2006 Coll on forest ranger service.
5. MA SR Regulation No 441/2006 Coll laying down detailed rules for the forest management plan licence exam and for the issuance and forfeit of the certificate validating professional and technical competence for the forest management plan design.
6. MA SR Regulation No 451/2006 Coll on certified forest manager.
7. MA SR Regulation No 453/2006 Coll on forest management planning and forest protection.

8. MA SR Regulation No 481/2006 Coll laying down detailed rules for the forest uniform use.
9. Act No. 595/2006 Coll amending Act No 92/1991 Coll laying down detailed rules for the transfer of state property to other organizations in the wording of the pursuant regulations and adapting Act No 229/1991 Coll regulating ownership rights to land and other agricultural properties in the wording of the pursuant regulations.
10. MA SR Notification No 645/2006 Coll on the issuance of Order No 2545/2006-100 of 26 October 2006 amending MA SR Order No 806/2004-100 of 13 April 2004 laying down detailed rules for granting subsidies for agriculture, food and forestry (Notification No 224/2004 Coll) in the wording of MA SR Order No 1467/2006-100 of 25 January 2006 (Notification No 61/2006 Coll).



2. FOREST FUNCTIONS

In the preparatory phase of the EU Forest Action Plan, the European Commission together with member states formulated a common vision of forest and forestry development and their contribution to modern society, which reads:

Forests for society: long-term multifunctional forestry that fulfils present and future societal needs and fosters existence/livelihood dependent on forestry.

Polyfunctional forestry provides a wide range of economic, ecological, social and cultural benefits. At the same time, it ensures supply of renewable and environmentally clean raw materials and plays an important part in the economic development, employment and prosperity of global regions, rural in particular. The contribution of world's forests to conserving biodiversity, water balance and global carbon cycle is undeniable and widely recognised. Yet there is more to forests than that – they also significantly improve the quality of life by creating pleasant and healthy living environment, creating opportunities for outdoor recreation and leisure pursuits, enhancing ecological and aesthetic values of cultural landscapes, and all this without compromising natural beauties of particular regions. At the same time, they also contribute to the preservation of spiritual and cultural heritage of our forebears.

Recent slow development of the sector has chiefly been contributed to a lack of understanding of a very specific character of the forest production cycle in newly arising socio-economic conditions. There are a number of specific aspects of forestry production when compared to other industries of national economy including:

- Forests constitute production instrument as well as the environment, i.e. are found both in the production sphere and outside it.
- Forests represent a valuable natural resource and provide multiple benefits; at the same time, they constitute the most important ecological element of a particular landscape and reinforce its stability.
- Forestry industry is traditionally considered a sector of primary industrial production; nevertheless, it is also an important provider of tertiary services.
- With its production of timber and other marketable goods and services, it contributes to gross domestic product; on the other hand, it also provides multitude of other non-market benefits and services without any economic realization (public compensation for delivered environmental services and benefits).

Multifunctional character and importance of forests for the society are generally widely acknowledged, but it is not so if funding is considered (compensations for commercially unrealised goods and services provided for the society). The volume of public subsidies allocated to forestry in 2006 reached only 5.7 percent in fixed prices when compared to 1990.

Since only economically competitive forest sector is able to ensure the sustainable character of forest production and long-term provision of multiple forest benefits it is imperative to enforce, reason and implement a number of measures to reinforce its competitiveness. It is thus desirable:

- along with rational exploitation of production forest functions to increase the range of commercially realised goods and services at present considered unmarketable;
- to improve methods used for evaluation of non-production forest functions;
- to define management measures aimed at enhancement of functional capacity of forests;
- to differentiate between standard and specific management regimes;
- to design, implement and improve the system of financial compensation for society delivered forest benefits and services using a range of currently available resources: public funding (EU, state budget), state subsidies, compensations for lost income, tax concessions, contract-based delivery of goods and services, payments for environmental services, etc.

From the ecological point of view, forest functions are defined as a complex of forest responses & impacts on particular biotic and abiotic components of terrestrial ecosystems. From the anthropocentric point of view, they are understood as services provided for the society or other claimant groups by forests and forestry. Forest functions can generally be divided into three main groups – economic (production), ecological (protection), and social.

2.1. Production functions

Production of high quality timber without compromising other important ecological and social functions is seen as a primary objective in the management of commercial forests. At present, this category of forests in Slovakia covers 1, 304.8 thousand hectares which represents 67.5 percent of the total forest crop land.

The majority of commercial forests are multifunctional, which means that on top of their production function they also fulfil a number of other ecological and social functions (Table 2.1–1). A multitude of environmental and social benefits is long-term ensured through the implementation of specific measures integrated into a so-called functionally integrated forest management system. This system is designed to preserve and further improve actual functional capacity of forests and is based on a close-to-nature management

aimed at enhancement of ecological stability and improvement of species, age and spatial structure of particular forest stands.



Figure 2 Majority of the forest sector income come from timber

Table 2.1–1 Functional types and their area in commercial forests

Function	Functional type	Area	
		ha	%
Production	Production	124 524	6.4
	Erosion control-production	670 198	34.7
	Water conservation-production	116 622	6.0
	Deflation control-production	7 742	0.4
	Recreation-production	237	0.0
	Nature conservation-production	58 637	3.0
	Air pollution mitigation-production	326 724	17.0
	Game husbandry-production	76	0.0
Total		1 304 760	67.5

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI) 2007

Note: The percent of a particular functional type is computed from the total forest area.

In addition to timber, commercial forests also provide a multitude of non-wood forest products including forest berries, mushrooms, mosses, lichens, and game as well as a number of commercially realised benefits resulting from multiple ecological and social functions.

2.2. Ecological functions

All forests regardless of typing provide a whole range of ecological functions. The forests where these are the main management objective are designated as protection forests. Their functional typing depends on natural *in-situ* conditions. The main management objective in these forests is to ensure continual fulfilment of ecological functions (water and soil protection, biodiversity, land-scape conservation). These forests, which primarily provide soil protection and water conservation benefits, are of great importance for the society development. In Slovakia, they currently cover 328.5 thousand hectares (17 percent of the total forest crop land).



Figure 3 Forests on extreme sites primarily secure soil protection and water conservation objectives

Table 2.2–1 Functional types and their area in protection forests

Function	Functional type	Area	
		(ha)	%
Erosion control	Erosion control	19 182	1.0
	Production-erosion control	19 447	1.0
	Water conservation-erosion control	10 519	0.6
	Water purification-erosion control	23 490	1.2
	Recreation-erosion control	172	0.0
	Spa&wellness-erosion control	227	0.0
	Nature conservation-erosion control	44 376	2.3
	Air pollution mitigation-erosion control	129 023	6.7
	Game husbandry-erosion control	364	0.0
Total		246 800	12.8
Water conservation	Water conservation	613	0.0
	Production-water conservation	675	0.0
	Erosion control-water conservation	36 087	1.9
	Nature conservation-water conservation	12 460	0.6
	Air pollution mitigation-water conservation	23 004	1.2
Total		72 839	3.8
Avalanche control	Avalanche control	92	0.0
	Water conservation-avalanche control	2 079	0.1
	Air pollution mitigation-avalanche control	2 471	0.1
Total		4 642	0.2
Streamside protection	Streamside protection	465	0.0
	Air pollution mitigation-streamside protection	451	0.0
Total		916	0.0
Deflation control	Deflation control	2 561	0.1
	Game husbandry-deflation control	20	0.0
	Air pollution mitigation-deflation control	746	0.0
Total		3 327	0.2
TOTAL		328 524	17.0

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI) 2007

Note: The percent of a particular functional type is computed from the total forest area.

2.3. Social and cultural functions

Social functions are considered primary in forests designated for specific public or group needs for special-purpose forests. Meeting these multiple needs will always to a certain degree limit management options available in these forests. These forests are managed applying a so-called functionally differentiated management system allowing for the purposeful reinforcement of one or more selected functions, such as water purification, recreation, nature conservation, spa&wellness, education&research, etc. This category of forests currently covers 298.8 thousand hectares, which accounts for 15.5 percent of the total forest crop land.



Figure 4 Forests provide ample opportunities for recreation

Table 2.3–1 Functional types and their area in special-purpose forests

Function	Functional type	Area	
		(ha)	%
Water purification	Water purification	1 918	0.1
	Air pollution mitigation-water purification	11 352	0.6
Total		13 270	0.7
Recreation	Recreation	828	0.0
	Production-recreation	3 556	0.2
	Erosion control-recreation	4 405	0.2
	Water conservation-recreation	3 336	0.2
	Nature conservation-recreation	1 691	0.1
	Air pollution mitigation-recreation	15 155	0.8
Total		28 971	1.5
Spa&wellness	Spa&wellness	255	0.0
	Production-spa&wellness	641	0.0
	Erosion-spa&wellness	1 463	0.1
	Water management-spa&wellness	402	0.0
	Air pollution mitigation-spa&wellness	448	0.0
Total		3 209	0.1
Nature conservation	Nature conservation	16 604	0.9
	Air pollution mitigation-nature conservation	29 535	1.5
Total		46 139	2.4
Air pollution mitigation	Air pollution mitigation	1 036	0.1
	Erosion control-air pollution mitigation	70 146	3.6
	Water conservation-air pollution mitigation	14 066	0.7
	Avalanche control-air pollution mitigation	0	0
	Deflation control-air pollution mitigation	1	0.0
	Water purification-air pollution mitigation	4 573	0.2
	Recreation-air pollution mitigation	629	0.0
	Nature conservation-air pollution mitigation	1 356	0.1
Total		20 901	1.1
Total		112 708	5.8

Table 2.3–1 – contd.

Function	Functional type	Area	
		(ha)	%
Game husbandry	Game husbandry	249	0.0
	Production-game husbandry	10 572	0.5
	Erosion control-game husbandry	8 454	0.4
	Air pollution mitigation-game husbandry	2 925	0.2
Total		22 200	1.1
Education&research	Education&research	7 075	0.4
	Air pollution mitigation-education-research	2 713	0.1
	Other special, closely unspecified functions	58 860	3.1
	Air pollution mitigation-other special functions	3 618	0.2
Total		72 266	3.8
TOTAL		298 763	15.4

Source: *Compendium of Slovak Forestry Statistics (SFMP, PFI) 2007*

Note: The percent of a particular functional type is computed from the total forest area.

2.4. Functional forest categories

The special system of forest categorisation has primarily been developed for management and planning purposes. In practical management, it is mainly used for the following: forest plot protection; compensation for a loss of non-production forest functions; a loss of property values owing to special management restrictions. In planning, it is used as one of the few key management model identifiers. Functional categories characterise the nature of key management objectives in a particular forest stand, i.e. the hierarchy of functional preferences.



Figure 5 Predominant forest function determines a choice of management methods

Increasing public demand for social and ecological contribution of forests has resulted in a gradual decrease of the area of commercial forests in favour of protection and special-purpose forests. In Slovakia, as in many other developed societies, the benefits of forests for recreation and amenity values or the maintenance of biodiversity and natural features of cultural landscape are now becoming widely recognised.

Table 2.4–1 Forest category area and forests with timber production potential

Forest category	1980		1990		2000		2005		2006	
	(thousand / %)						(ha / %)			
Commercial	1 439.1	77.3	1 367.1	71.1	1 273.8	66.3	1 307 723	67.7	1 304 760	67.5
Protection	183.8	9.9	258.5	13.5	306.7	16.0	327 843	17.0	328 526	17.0
Special-purpose	187.6	10.1	230.9	12.0	340.9	17.7	296 079	15.3	298 763	15.5
Land for afforestation	51.1	2.7	65.2	3.4	—	—	—	—	—	—
Total	1 861.6	100	1 921.7	100	1 921.4	100	1 931 645	100	1 932 049	100

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI) 2007





Figure 6 Dwarf pine is the dominant species of the 8th vegetation zone

3. FOREST CONDITION AND ITS CHANGES

3.1. Natural conditions

Slovak forests grow in a very wide range of different natural conditions. In response of these differences, a very detailed system of forest site type (FST) units based on site conditions of a particular stand has been introduced. Each FST and its advanced unit – management unit of forest site types (FSTMU) are characterised by a set of parameters including an altitudinal vegetation zone (AVZ), soil conditions,

water regime and physical landscape features. Each vegetation zone is further characterised by its altitude range, the length of vegetation period, average annual temperature, and total annual precipitation.

Table 3.1–1 Forest vegetation zones

Altitudinal vegetation zone								Total
Oak	Oak-beech	Beech-oak	Beech	Beech-fir	Fir-beech-spruce	Spruce	Dwarf mountain pine	
ha / %								
140 167	265 246	457 480	401 880	419 337	186 365	41 323	20 251	1 932 049
7.3	13.7	23.7	20.8	21.7	9.6	2.1	1.1	100.0

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI) 2007

FSTMU groups FSTs with similar natural conditions. Forest stands grouped into particular FSTMU show a similar kind of response to silvicultural, felling and protection measures; for this very reason the FSTMU units are used to define management objectives in particular forest stands.

Table 3.1–2 Commonest forest site type management units (> 20 thousand ha)

FSTMU	Unit	Area (ha)	FSTMU	Unit	Area (ha)
108	Oak – hornbeam woods on loess	24 427	402	Calcareous beech woods	31 650
111	Fertile oak – hornbeam woods	20 144	410	Fertile beech woods (drier type)	96 962
112	Oak – pine woods on most productive acid soils	26 308	411	Fertile beech woods	153 466
208	Oak – beech woods on loess	87 925	413	Moist beech woods	22 231
209	Dry oak – beech woods	39 834	416	Beech woods with <i>Tilia</i> spp. on rocky soils	22 975
211	Oak – beech woods	76 309	502	Calcareous beech – fir woods	25 117
302	Calcareous beech – oak woods	21 988	505	Acid spruce – (beech) – fir woods	49 264

Table 3.1–2 – contd.

305	Acid beech – oak woods	35 130	511	Fertile – beech – fir woods	247 774
310	Fertile beech – oak woods (drier type)	125 733	592	Calcareous beech – fir woods (protection type)	25 083
311	Fertile beech – oak woods	172 021	605	Acid spruce – (beech) – fir woods	31 247
313	Moist beech – oak woods	36 076	611	Fertile spruce – beech – fir woods	62 598
316	Beech – oak woods with <i>Tilia</i> spp. on rocky soils	20 195	—	Other	477 592
Total forest crop land					1 932 049

Source: *Compendium of Slovak Forestry Statistics (SFMP, PFI) 2007*

3.2. Forest area

The area of forest plots (FP), hereinafter only "forest area," has in recent decades experienced a net gain. Since 1950, it has grown by 235,840 hectares (11.8 percent). A similar gain has been recorded in the area of forest crop land (FCL), i.e. the area of forest stands including non-stocked forest land selected for restocking, which has increased by 168, 993 hectares (9.6 percent) since 1950. The largest gain in total forest area was observed in 1960–1970; FCL area grew most markedly in 1960–1990. Official forestry statistics also suggest an interannual gain in forest area utilisable



Figure 7 Area of Slovak forests is continually rising

for timber production. Forests for timber production are defined as forests in which natural, site and regulatory conditions provide for timber production. These forests do not include forests in protected areas under the 5th level of protection, forests in the 1st level buffer zones of water resources, forests in the dwarf mountain pine vegetation zone, and forests on extreme sites.

Forest cover (given as the total forest area-total country area rate) reached an estimated 41 percent in 2006.

Table 3.2–1 Forest land and forest crop land

Type	1950	1960	1970	1980	1990	2000	2005	2006
	ha							
FP	1 771 166	1 775 644	1 918 571	1 952 656	1 976 538	1 997 961	2 006 172	2 007 006
FCL	1 763 056	1 769 012	1 826 564	1 861 642	1 921 705	1 921 414	1 931 645	1 932 049
Forests available for wood supply							1 751 165	1 757 520

Source: Compendium of Slovak Forestry Statistics (National Forest Inventory 1949–1953, Forest Inventory 1960, SFMP, PFI)

Except for FP and FCL, there is a certain percentage of farmland and other land covered by forest tree species (so-called "other wooded land"). This land has not previously been included in forest mapping nor has it been covered by a detailed survey of forest condition. This changed in 2005, when the National Forest Inventory and Monitoring (NFIM) 2005–2006 for the first time in history covered the entire forest tree species area including forest inventory plots (Chapter 9.1) and other wooded land. The nature of a particular stand (forest, other wooded land) was decided on the basis of internationally agreed FAO definition of forest: the plot is covered by forest tree species if the potential height of vegetation is over 5m, minimal plot acreage exceeds 0.3 ha, minimal width is 20m, and canopy density is 20 percent or above. Results provided by this inventory brought current forest cover of Slovakia up to 44.3 percent, which is up by 3.3 percent when compared to official statistics.

FP and FCL are for practical tenure and management reasons further divided into the Forest Spatial Division Units (FSDUs), which are represented by the Forest Tenure Units (FTUs) and within them their sub-units called compartments. Compartments might consist of up to several sub-compartments (plots significantly differing in age or composition) and temporary crop groups found in regenerating forest stands.

Table 3.2–2 Average size of forest spatial division units (ha)

Year	FTU	Compartment	Sub-compartment	Crop group
	ha			
2006	876	7.14	4.94	2.98
2005	881	7.19	4.98	3.00
2004	829	7.25	5.06	3.04
2003	883	7.32	5.12	3.08
2002	988	7.40	5.20	3.13

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI)

3.3. Tree species composition and origin of forest



Figure 8 Spruce is after beech the second most common tree species of Slovak forests

In the past, the tree species composition of Slovak forests was most influenced by the drive for maximum timber production. To meet this objective, spruce and pine were planted in large numbers. From the 1950s onwards, though, forest planners gradually started to realize the importance of species composition based on exact conditions of a particular site. At the same time, public demand for a delivery of a multitude of forest functions including non-productive forest benefits and services started to grow. At present, the demand for conservation of forest biodiversity has increasingly been recognised as

one of the most fundamental objectives of modern-day forest management. This approach has significantly contributed to improved ecological stability of forest ecosystems and their sustainable development even if particular tree species suffer under dramatic changes to site conditions brought on by climate change, human activities or natural disturbances.

Table 3.3–1 Tree species in Slovak forests

Tree species (%)									
SM	JD	BO	SC	KS	Σ I	DB	CR	BK	HB
26.1	4.0	7.2	2.4	1.1	40.8	10.9	2.5	31.2	5.7
JV	JS	AG	BR	JL	LP	TD	TS	OL	Σ L
2.0	1.4	1.7	1.4	0.8	0.4	0.4	0.5	0.3	59.2

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI), 2007

Legend: SM – spruce; JD – fir; BO – pine; SC – larch; KS – dwarf pine; Σ I – total conifers; 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 broad-leaf; Σ L – total broad-leaf

Table 3.3–2 Main tree species groups (conifer, broad-leaf) and main forest tree species

Species	1970	1980	1990	2000	2005	2006
	%					
Conifer	41.3	42.5	42.3	41.9	41.0	40.8
Broad-leaf	58.7	57.5	57.7	58.1	59.0	59.2
Spruce	26.0	26.4	27.3	26.8	26.3	26.1
Fir	6.2	5.8	5.0	4.3	4.1	4.0
Pine	6.7	7.5	7.0	7.5	7.2	7.2
Beech	30.1	29.5	29.8	30.3	31.0	31.2
Oak + Turkey oak	14.4	14.4	14.2	13.6	13.4	13.4
Hornbeam	6.2	5.7	5.6	5.7	5.7	5.7

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI)

The Table clearly indicates a gradual decline in the presence of conifer species, including less resilient spruce, in favour of broad-leaf species which are able to form more stable stands better responding to ongoing site condition changes. The sharpest decline in the presence of any conifer species was observed in fir (down by one third or 2.2 percent on 1970 figures).

The degree of forest stability and resilience is best described through tree species diversity in a particular forest stand. Figures describing different classes of forest species “diversity” are given in Tables 3.3–3 and 3.3–4.

Table 3.3–3 Area of conifer, broad-leaf and mixed forests

Forests with conifer percent		Forests with broad-leaf percent		Mixed forests	Non-stocked forest land	Total
+ 91 %	75–90 %	+ 91 %	75–90 %			
ha / %						
472 507	123 371	818 133	142 968	364 318	10 752	1 932 049
24.4	6.4	42.3	7.4	18.9	0.6	100.0

Table 3.3–4 Area of forest stands by a number of present tree species

No. of tree species									Non-stocked forest land	Total
1	2	3	4	5	6	7	> 8			
ha / %										
339 915	445 255	492 100	339 556	178 567	78 946	31 489	15 470	10 751	1 932 049	
17.6	23.0	25.5	17.6	9.2	4.1	1.6	0.8	0.6	100.0	

Source: *Compendium of Slovak Forestry Statistics (SFMP, PFI), 2007*

In Slovak forest management guidelines, high forest as an opposed form to coppice is considered a basic type of forest origin. Coppice covers only 1.85 percent of the total forest crop land and is further decreasing (down by 6.2 percent on 1980 figures). Coppice formed by coppice shoots is considered a management unsuitable form since it provides a limited volume of low quality timber. The average growing stock per hectare in commercial and special-purpose coppice is estimated at 109 m³. This volume is markedly lower than the average growing stock in high commercial forests estimated at 234 m³ per hectare. Coppice in conversion currently covers 7,286 hectares, of which 2,697 hectares is formed by mature stands.

Table 3.3–5 Coppice area

Forest origin	1980	1990	2000	2005	2006
ha / %					
Coppice	151 217	79 324	42 157	36 333	35 756
	8.12	4.13	2.19	1.88	1.85

Source: *Compendium of Slovak Forestry Statistics (SFMP, PFI)*

As in other European countries, Slovak forests also feature a number of naturalised exotic tree species. Some of them, such as Douglas fir, grand fir and northern red oak have adapted so well that they thrive in their new homeland. Forest area formed by introduced species remains largely stable except for highly expansionary black locust that has been uncontrollably spreading also to other wooded land.

Table 3.3–6 Introduced tree species on FL

Species	%
Black locust	51,9
Populus x euroamericana (I 214 + Robusta)	0.38
Black pine	0.50
Douglas fir; grad fir; eastern white pine	0.07
Northern red oak; sweet chestnut; horse chestnut; ash-leaf maple	0.14

Source: *Compendium of Slovak Forestry Statistics (SFMP, PFI), 2007*

3.4. Age class structure

The age structure of forests is best described through the classification using 10-year age classes. Even distribution of age classes is the best guarantee of sustainable and steady timber production, delivery of other forest-related benefits and services, and the stable development of the volume of forestry operations. As for the assessment of the actual forest age structure, this is based on a so-called optimal area of age classes which depicts as a horizontal line with an end decline due to differences in particular rotation periods (Figure 3.4–1). At present, the age structure of Slovak forests shows the above standard presence of middle age (6th–10th) and oldest (15+) age classes (Figure 3.4–1) with the 15+ age class forests mostly found in protection forests. These forests have due to their protective functions generally longer rotation periods. All age classes are typical for a higher presence of conifer species; the trend is most evident in the 6th–9th age classe forests (Figure 3.4–2).



Figure 9: Even distribution of age classes ensures sustainable and balanced timber production and provision of other non-wood forest benefits and services

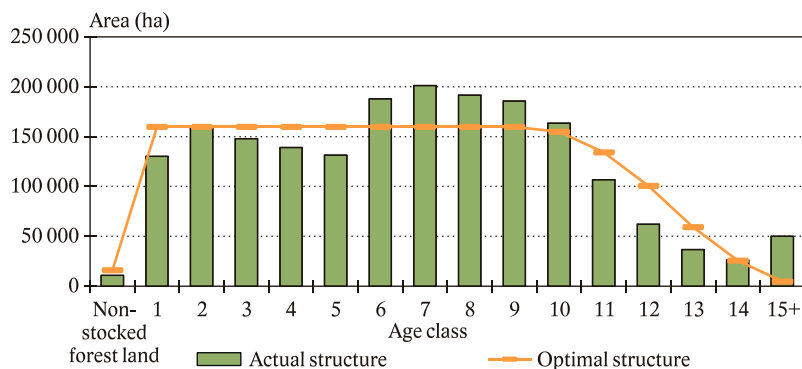


Figure 3.4–1 Age structure (actual & optimal)

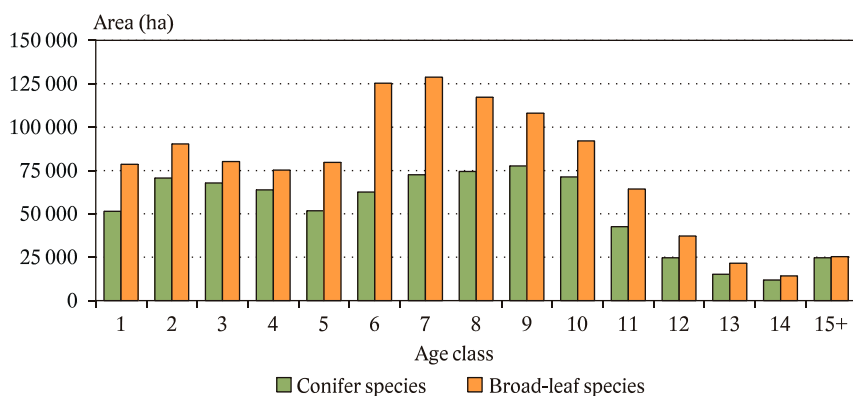


Figure 3.4–2 Age structure by species group (conifer, broad-leaf)

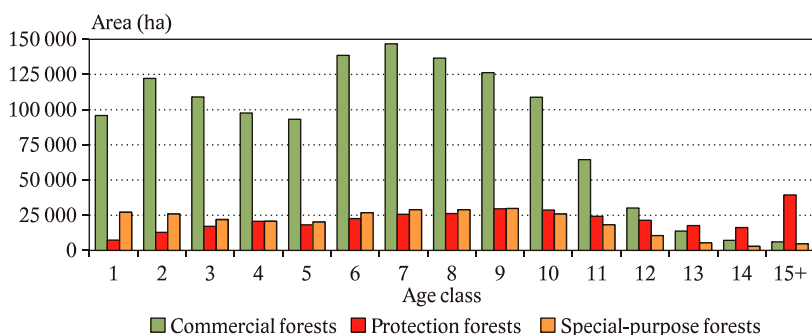


Figure 3.4–3 Age structure by functional forest category

It is important to realize, that the presence of various harmful agents accompanied by other forest production factors provides for only a theoretical possibility of reaching the optimal age structure. The analysis of long-term trends in the age structure of Slovak forests using the 1950+ data has nevertheless shown its gradual approximation.

Table 3.4–1 Age structure (actual & optimal) in total and by species group

Age class structure- actual		Age class									
		Non-stocked forest land	1	2	3	4	5	6	7		
Total	ha	10 752	130 072	160 845	147 998	139 106	131 520	187 983	201 302		
	%	0.6	6.7	8.3	7.7	7.2	6.8	9.7	10.4		
of which	CO	ha	—	51 466	70 608	67 867	63 882	51 854	62 617		
		%	—	2.7	3.6	3.5	3.3	2.7	3.2		
	BR	ha	—	78 606	90 237	80 131	75 224	79 666	125 366		
		%	—	4.0	4.7	4.2	3.9	4.1	6.5		
		Age class		8	9	10	11	12	13	14	15+
		Total	ha	191 684	185 712	163 454	106 825	62 015	36 709	26 045	50 029
%	9.9		9.6	8.5	5.5	3.2	1.9	1.4	2.6		
of which	CO	ha	74 447	77 673	71 353	42 541	24 722	15 167	11 833	24 683	
		%	3.8	4.0	3.7	2.2	1.3	0.8	0.6	1.3	
	BR	ha	117 237	108 039	92 101	64 284	37 293	21 542	14 212	25 346	
		%	6.1	5.6	4.8	3.3	1.9	1.1	0.8	1.3	
		Age class structure - optimal		Age class							
				Non-stocked forest land	1	2	3	4	5	6	7
Total	ha	15 967	159 673	159 673	159 673	159 673	159 673	159 673	159 673		
	%	0.8	8.3	8.3	8.3	8.3	8.3	8.3	8.3		
	Age class		8	9	10	11	12	13	14	15+	
	ha	159 673	159 673	154 883	134 126	100 594	59 079	25 548	4 790		
	%	8.3	8.3	8.0	6.9	5.2	3.1	1.3	0.2		

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI), 2007

Note: CO – conifers; BR – broadleaves.

Table 3.4–2 Percent of approximation of actual structure to optimal structure

Year					
1950	1970	1990	1995	2000	2005
%					
86.7	85.6	87.6	89.1	90.0	90.3

Source: NFC-FRI Zvolen, 2007

One of the most fundamental tools of ensuring sustainable and steady character of timber production is the rotation period. This period is derived from the maturity age of particular tree species in a way to optimise the most important aspects of forest production (monetary, technical, economic, and ecological). The average rotation period of Slovak forests is currently 121 years – 107 years for commercial forests, 115 years for special-purpose forests, and 189 years for protection forests.

Another of key forest parameters – the regeneration period, is defined by a number of years needed to ensure successful completion of the regeneration process in a particular forest stand. The average length of this period, which mainly depends on silvicultural systems applied, is 40 years; 30 years for commercial forests and 33 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.

Rotation and regeneration periods are used to divide forest stands into mature and intermediate (immature) stands. The above-normal area of intermediate stands in the 6th–9th age classes (Figure 3.4–1) contributes to an increase in the average age of particular tree species (Table 3.4–3) and forests in general. Their average age will, however, gradually decrease as stands of overrepresented age classes reach maturity and enter a regeneration phase. Upon entering this phase, their area will automatically be transferred to the 1st age class.

Table 3.4–3 Average age of selected tree species

Year	Species								
	SM	JD	BO	SC	DB	BK	HB	JV	JS
	Age in years								
2006	68.1	77.3	64.3	48.1	75.8	71.1	64.2	51.9	52.9
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: Compendium of Slovak Forestry Statistics (SFMP, PFI)

3.5. Spatial structure

From the viewpoint of conservation of natural forest features (naturalness), forests are divided into primeval forests, natural forests with no apparent traces of human intervention, semi-natural forests, and, lastly, transformed or converted forests (Table 3.5–1). Naturalness of a particular stand is assessed on the basis of its composition and spatial structure parameters. At present, majority of European forests originate from planting and thus their spatial and age structure to a various degree differ from that of natural forests. Improvements in the spatial structure of current forests can be achieved through the implementation of suitable silvicultural systems, tending and regeneration measures in particular.

Table 3.5–1 Forests by the degree of naturalness

Natural forest	Semi-natural forest	Primarily semi-natural forest	Transformed forest	Converted forest	Total
ha / %					
94 670	1 147 637	413 459	274 351	1 932	1 932 049
4.9	59.4	21.4	14.2	0.1	100

Source: National Forest Inventory and Monitoring, 2007

As for the age and vertical structure, prevailing majority of Slovak forests belong to single-storey, age and height little differentiated forests (78.7 percent). Three- or multi-storey forests, on the other hand, are found only on the 2.1 percent of the total forest area.

Table 3.5–2 Vertical structure by functional forest category

Category	Forest crop land area	Single-storey stands		Two-storey stands		Three- and multi-storey stands	
	ha	ha	%	ha	%	ha	%
Commercial	1 304 760	1 046 351	80.2	234 659	18.0	23 750	1.8
Protection	328 526	244 010	74.3	76 268	23.2	8 248	2.5
Special-purpose	298 763	230 245	77.1	59 137	19.8	9 381	3.1
Total	1 932 049	1 520 606	78.7	370 064	19.2	41 379	2.1

Source: *Compendium of Slovak Forestry Statistics (SFMP, PFI), 2007*

3.6. Growing stock

Latest statistics show a steady increase in the volume of growing stock available in Slovak forests. As at 31 December 2006, the volume of growing stock reached 443.8 million m³ of timber with a top diameter >7 cm inside bark (i.b.). The average stock per hectare was estimated at 231 m³ of the abovementioned size timber.

Table 3.6–1 Growing stock

Growing stock	1970	1980	1990	2000	2005	2006
	million m ³				m ³	
Total	313.3	324.0	348.5	410.0	438 905 076	443 780 432
Conifer	169.0	170.0	178.9	199.1	207 354 221	209 799 067
Broad-leaf	144.3	154.0	169.6	210.9	231 550 855	233 981 365
Per ha	171	174	181	215	229	231
Growing stock in forests available for wood supply	Total				403 439 263	409 104 812
	of which				Conifer	187 925 355
					Broad-leaf	215 513 908

Source: *Compendium of Slovak Forestry Statistics (SFMP, PFI)*

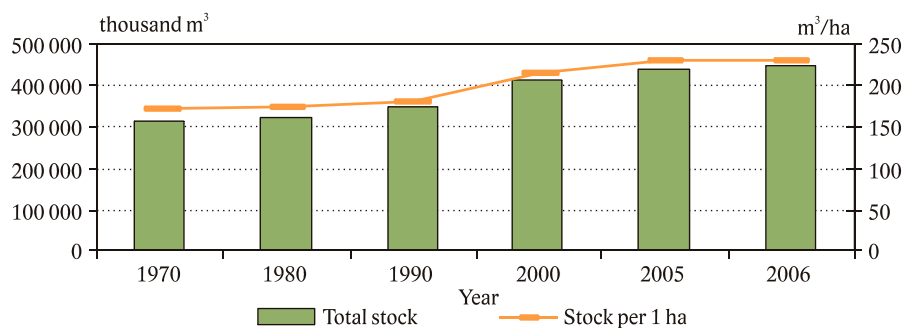


Figure 3.6–1 Growing stock and average stock per 1 ha

The volume of growing stock available in particular age classes is given in Table 3.6–2 and Figure 3.6–2, the latter of which additionally illustrates the target distribution of growing stock derived from the optimal age structure (Table 3.4–1).

Table 3.6–2 Growing stock by age class

Growing stock		Age class							
		1	2	3	4	5	6	7	8
Total	thousand m ³	108	2 370	12 614	20 793	26 013	44 771	55 637	59 420
	%	0.02	0.54	2.84	4.69	5.86	10.09	12.54	13.39
Per ha	m ³	1	15	85	149	198	238	276	310
Age class		9	10	11	12	13	14	15+	Total
Total	thousand m ³	63 292	59 848	40 443	22 112	12 814	8 181	15 364	443 780
	%	14.26	13.49	9.11	4.98	2.89	1.84	3.46	100.00
Per ha	m ³	341	366	379	357	349	314	307	231

Source: *Compendium of Slovak Forestry Statistics (SFMP, PFI), 2007*

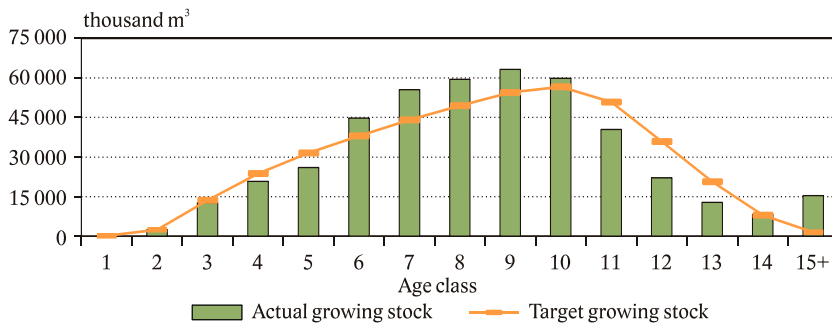


Figure 3.6–2 Actual and target distribution of growing stock by age class

At present, the volume of growing stock available in Slovak forests is increasing. This positive trend can be attributed to both the uneven structure of age classes with above-normal spatial (Chapter 3.4) and volumetric (Chapter 3.6) structure of mostly intermediate 50–100 year-old forest stands and more accurate methods of growing stock estimate (new Yield Tables).

The actual volume of growing stock accrued in forest over a certain period of time (e.g., one year) represents the total current increment (TCI). TCI, however, cannot be used as an indicator of allowable annual cut since its volume is determined by the structure of age classes. Maximum TCI levels are observed in forests with a significant presence of age classes typical for high increment, i.e. in intermediate forests (3rd–6th age classes). This is the reason why only an estimated 60 percent of the TCI volume can presently be harvested. The felling volume-TCI rate given in Table 3.6–3 for 2005–2006 (88 and 71 percent, respectively) significantly tops current felling potential of Slovak forests. Observed discrepancy is the result of salvage of calamitous windthrow from November 2004.

Trends in total and hectare values of TCI indicate a gradual increase in the volume increment; the fact has chiefly been associated with the current age structure of Slovak forests and growing stock development.

Table 3.6–3 Total current increment

Indicator		1980	1993	2000	2005	2006
TCI	thousand m ³	8 842	10 008	11 204	11 584	11 671
TCI per ha	m ³	4,75	5,19	5,83	6,10	6,14
Felling volume	thousand m ³	5 864	4 185	6 218	10 190*	8 357*
Felling volume-TCI rate	%	66,3	41,8	55,5	88,0	71,6

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI)

*Volume of timber harvested in 2005 and 2006 was impacted by salvage of calamitous windthrow from November 2004

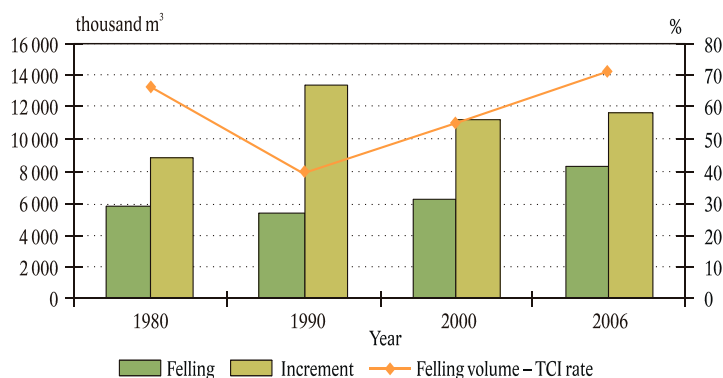


Figure 3.6–3 TCI and felling volume-TCI rate

Table 3.6–4 Total current increment by functional forest category

Year	Category					
	Commercial		Protection		Special-purpose	
	TCI					
	Total	Per ha	Total	Per ha	Total	Per ha
	thousand m³	m³	thousand m³	m³	thousand m³	m³
2006	8 250	6,36	1 525	4,95	1 896	6,38
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: Compendium of Slovak Forestry Statistics (SFMP, PFI)

*Forest Information Centre adjusted 2004 TCI data for the particular functional category in the Compendium of Slovak Forestry Statistics (May 2005)



4. FACTORS INFLUENCING FORESTS

4.1. Climatic conditions

Geographically, Slovakia is a very diverse country. Her west and north are formed by the arc of the Western Carpathians while her southern parts are dominated by vast lowlands. Diversity of her natural conditions and physical landscape is also reflected in local climatic conditions that vary considerably between its particular regions. A large part of the country's surface is covered by rolling mountainous topography with highlands and mountains. These topographic features form an estimated 60 percent of the country's area. The remaining 40 percent are formed by lowlands. The altitude ranges between 94 and 2 655m. In a broader European context, her territory belongs to a sub-montane to montane type of landscape.

From a climatic point of view, Slovakia belongs to a moderate climatic zone with climate significantly influenced by both altitude and topography. Its western part is more influenced by the Atlantic Ocean whereas its eastern regions are under the influence of continental climate. The average annual temperature in lowland regions varies between 9 – 10 °C whilst highest mountain locations (> 2 500m) record a sub-zero average of -3.7 °C. The average temperature decreases by 0.5 °C for every 100m of altitude. As for the hours of daylight, southern regions experience an estimated 2 000 hours of daylight whereas in north-western parts this figure is down to around 1 600 hours.

Average annual precipitation for the entire country is 743 mm – 65 percent of it evaporates, remaining 35 percent is runoff. Snow cover is not stable and there are many years in which lower regions experience no permanent snow cover at all.

In recent decade, the territory of Slovakia has experienced a number of extreme weather events (prolonged droughts, flooding, violent wind storms) all of which had somewhat detrimental effect on forests. The year 2006 was statistically markedly hotter than average to confirm the trend set in the previous year which was considered very hot. According to long-term weather forecasts, 2007 is set to be even hotter. Extremely hot years are directly contributed to ongoing climatic changes. Even with the last year's total precipitation being average, its distribution remained largely uneven. An increasing rate of tree transpiration combined with increasing air and soil temperatures contributed to a gradual loss of soil moisture, particularly in the vegetation period. The loss was most apparent in the 1st–4th altitudinal vegetation zones. The aforementioned facts were reflected in the growing incidence of harmful agents and their impact on vitality and health of forest ecosystems.

4.2. Groundlevel air pollution

Burning of fossil fuels and industrial production are the main sources of air pollution by sulphur oxides and solid particulates. Since 1990, though, a downward trend in the amount of solid particulates and SO₂ released into the environment has been observed. Decreasing volumes of pollutants have been associated with the slump in industrial production and energy consumption as well as the drive for an increased use of noble fuels and fuels with improved quality parameters. Reduction in the amount of emitted solid particulates can also be contributed to the introduction of state-of-the-art separation



Figure 10 Magnesite processing factory in Hačava represents a major local polluter

techniques and their continual advancement. Additional improvement has been achieved through regulatory measures enforced in air quality management (ME SR Regulation No 705/2002 Coll on air quality executing Act No 478/2002 Coll on air protection amending Act No 401/1998 Coll on fees for air pollution in the wording of the pursuant regulations (the Air Act).

Traffic in particular is responsible for increased levels of nitrogen oxides and CO in the air. Emissions of NO_x have shown a slight decrease in the observed period of 1990–2006. 2003–2006 decline in the amount of NO_x emissions can to a large degree be attributed to denitrification of large energy producers.

The largest volume of *carbon* (CO) emissions comes from iron and steel works. The volume of these emissions has since 1990 been continually decreasing as a result of reduced fuel consumption and changed fuel structure in the category of small consumers. In the same term, the decrease of CO emissions produced by major industrial sources of pollution has been only moderate.

The increase in tropospheric ozone concentrations observed in industrially developed regions of northern hemisphere till the late 1980s was contributed to growing emissions of ozone precursors (NO_x , VOC, CO) emitted by traffic, energy production and industrial activities.

Since 1996, emissions of other pollutants have also steadily decreased. Reduced levels of pollutants across Europe resulted in the decreased acidity of rainfall in Slovakia. It is possible to say that detrimental impact of air pollution on tree species and forests has generally reduced, the only exception being high mountain locations where the risk of forest damage due to increased levels of tropospheric ozone still persists.

Acidification of forest soils has chiefly been attributed to sulphur and nitrogen depositions. Current condition of forest soils is largely the result of ground level pollution from previous decades. Soil acidification processes were most intense in higher altitudes and regions with more substantial local sources of acid emissions. The pH assessment has indicated that an estimated 25 percent of forest soils presently show a very acid reaction ($pH < 4.5$), 40 percent acid ($pH 4.5 - 5.5$), 17 percent moderately acid ($pH 5.5 - 6.5$), 5 percent neutral



Figure 11 Climate change scenarios project altitudinal shift in vegetation zones

(pH 6.5 – 7.2) and 13 percent moderately alkaline reaction (pH 7.2 – 8.0). There has also been a long-term problem with local/regional contamination of soils by heavy metals and alkaline pollutants, particularly in areas adjacent to large emissions sources.

4.3. Climate change and forests

Changes in global climate caused by emissions of greenhouse gases represent the most serious environmental concern in the history of mankind. The principal international regulatory mechanism on the protection of global climate – the Framework Convention on Climate Change (UN FCCC), was adopted on the United Nations Conference on Environment and Development in Rio de Janeiro (1992), also known as the Earth Summit. Its main target is to stabilise concentration of greenhouse gases at the level which has no detrimental impact on the global climate.

The most important greenhouse gas in the atmosphere is water vapour (H_2O). This gas is believed to be responsible for roughly two thirds of the total greenhouse effect. Its atmospheric concentration is not directly impacted by human activities; it is rather determined by natural water cycle in the landscape. Contribution of carbon dioxide (CO_2) to the final greenhouse effect is estimated at 30 percent whilst methane (CH_4), nitrous oxide (N_2O) and ozone (O_3) jointly account for 3 percent only. The presence of synthetic substances, such as HFCs (hydrofluorocarbons), PFCs (perfluorocarbons) and SF_6 (sulfur hexafluoride) in the atmosphere is on the other hand without doubt a direct result of global anthropogenic activities.

The greenhouse gas emissions peaked in the late 1980s to decrease by 25 percent in 1990–1994. Since 1994, the amount of emissions released into the environment remained more or less stable; more significant reduction in the emissions level was observed in 2000. In recent years, however, their amount started to grow again as a result of new investments in industrial production, an increased volume of traffic and changes in the fuel base.

In the past century, the territory of Slovakia grew significantly warmer (the average annual temperature rose by 1.1 °C, more substantially in winter) and drier (total annual precipitation was down by 5.6 percent). Average centennial figures for particular regions show certain variability in climatic parameters with southern Slovakia recording 10 percent decrease in the amount of precipitation. On the other hand, some northern and north-eastern regions at the same time observed precipitation increase by up to 3 percent. In addition, both the significant drop in relative air humidity (up to 5 percent) and snow cover duration were observed almost universally on the entire territory of the country. Other climatic variables (potential and actual evaporation rate, soil moisture, global radiation, radiation balance) also confirm gradual drying of the country with its southern regions being most severely hit as potential evapotranspiration grows and soil moisture falls. Values for solar radiation remained grossly unchanged in the period monitored.

In order to provide a qualified assessment of potential impacts of climate change on health and vitality of Slovak forests, a number of climatic models have been developed to determine climatic amplitudes of the natural distribution range of a particular tree species in Slovakia as well as the amplitudes of their factual distribution. The latter mentioned were derived from satellite imagery. The amplitudes were projected towards future following regional climate change scenarios (2001). Subsequent comparison of the acquired data provided for the assessment of spatial shift of distribution ranges corresponding with natural and current distribution of particular forest tree species. The analysis has been carried out for the following tree species: beech, oak, spruce, larch, fir, and pine. Its results clearly indicate that spruce in particular displays a marked divergence between its bioclimatic demands and its actual distribution.

4.4. Biological diversity and ecological stability of forests

Forests represent the most complex terrestrial ecosystem on our planet and as such significantly contribute to the conservation of global biodiversity. Biodiversity can be defined as the variety and complexity of life on Earth at all scales including species, ecosystem and genetic (morphological and physiological) levels.

Ecological stability of forests is one of the main prerequisite of sustainable development of forest sector as it underlies the long-term fulfilment of multiple benefits and services forests provide to society. It is important to realise that from the point of view of ecological stability at the ecosystem level, optimum biodiversity adjusted to local conditions is more desirable than maximum biodiversity. Since projected global climate change scenarios for regional and local levels have yet to be developed with sufficient accuracy and detail, it is impossible at this stage to accurately predict possible impact of these changes on particular tree species, their communities and forest ecosystems in general.

In 1997, in order to formulate national policy on biodiversity conservation and in response to the Article 6 of the Convention on Biological Diversity, the National Council of the Slovak Republic and the Slovak Government approved the *National Strategy on Biodiversity Conservation*. With regard to biodiversity conservation, Slovakia has done much to protect its natural biodiversity and rightly occupies one of the leading positions in Europe with over 70 fragments of natural and primeval forests with the total area of over 20,000 hectares still preserved on its territory.

Forest habitats harbour a wide range of different animal species (Sciurus vulgaris)





5. HARMFUL AGENTS

5.1. Abiotic agents

The volume of incidental felling induced by the mechanical action of wind, snow or rime amounted to 2, 149 thousand m³ in 2006. Figures illustrating trends in incidental felling underlay by abiotic harmful agents are given in Table 5.1–1.

Table 5.1–1 Incidental felling caused by abiotic agents 1997–2006 (m³ of timber)

Year	Wind	Snow	Rime	Total
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
2006	1 684 124	460 414	4 702	2 149 240
Total	18 000 284	799 065	682 928	19 482 277

Source: NFC-FRI Zvolen (Form L 116), 2006

The extent of forest damage caused by abiotic agents in 2006 is described in Table 5.1–2. Table 5.1–3 provides statistical overview of felling volumes realised in connection with abiotic agents split by particular tree species.

Table 5.1–2 Forest damage caused by abiotic agents 2006 (m³ of timber)

Harmful agent	Damaged	Salvaged	Remaining
Wind	2 002 839	1 684 124	318 715
Snow	489 487	460 414	29 073
Rime	4 740	4 702	38
Drought	133 101	120 155	12 946
Flooding	142	142	
Unknown causes	8 998	8 484	514
Other harmful agents	17 703	17 567	136
Total	2 657 010	2 295 588	361 422

Source: NFC-FRI Zvolen (Form L 116), 2006

Table 5.1–3 Volume of incidental felling by tree species (thousand m³)

Species	Wind	Snow	Rime	Drought	Unknown causes	Flooding	Other agents	Total
Spruce	1 231 081	400 845	407	45 410	3 547	10	8 226	1 689 526
Fir	63 877	4 978		910	570		2 657	72 992
Pine	42 221	29 025	323	40 039	1 794	46	3 845	117 293
Larch	17 874	2 062	14	431	3	16	12	20 412
Other conifers	834	702		420				1 956
Σ conifers	1 355 887	437 612	744	87 210	5 914	72	14 740	1 902 179
Oak spp.	30 782	1 753	187	10 710	1 267	50	330	45 079
Beech	237 509	15 108	3 424	12 256	872		923	270 092
Hornbeam	14 032	1 318	21	1 289	174		77	16 911
Maple spp.	3 299	412	34	52	25		16	3 838
Ash	2 230	90	54	1 110		8		3 492
Elm spp.	111		10				3	124
Birch spp.	2 687	635	13	3 903	60		61	7 359
Locust	5 085	1 012	112	207	4	12	1 288	7 720
Alder spp.	4 992	907	26	138	119			6 182
Poplar	8 857	1 112	55	1 226	8		109	11 367
Other broad-leaves	18 653	455	22	2 054	41		20	21 245
Σ Broad-leaves	328 237	22 802	3 958	32 945	2 570	70	2 827	393 409
Total	1 684 124	460 414	4 702	120 155	8 484	142	17 567	2 295 588

Source: NFC-FRI Zvolen (Form L 116), 2006

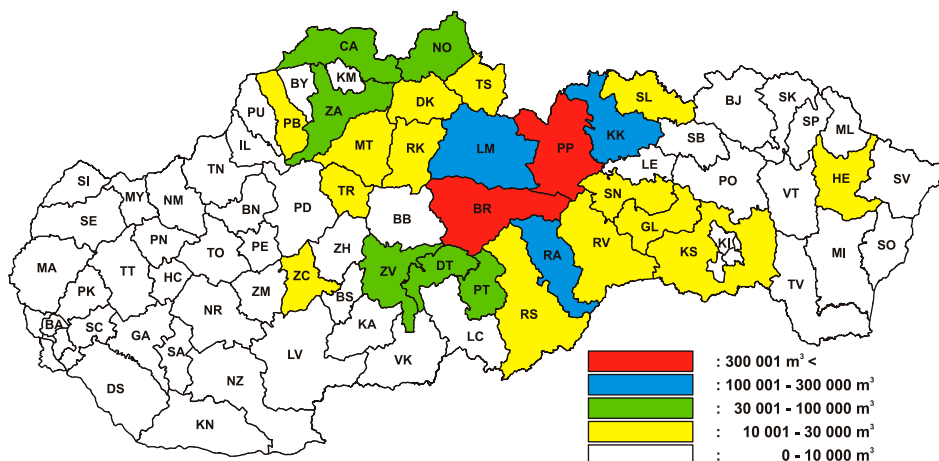


Figure 5.1–1 Wind damage by district 2006

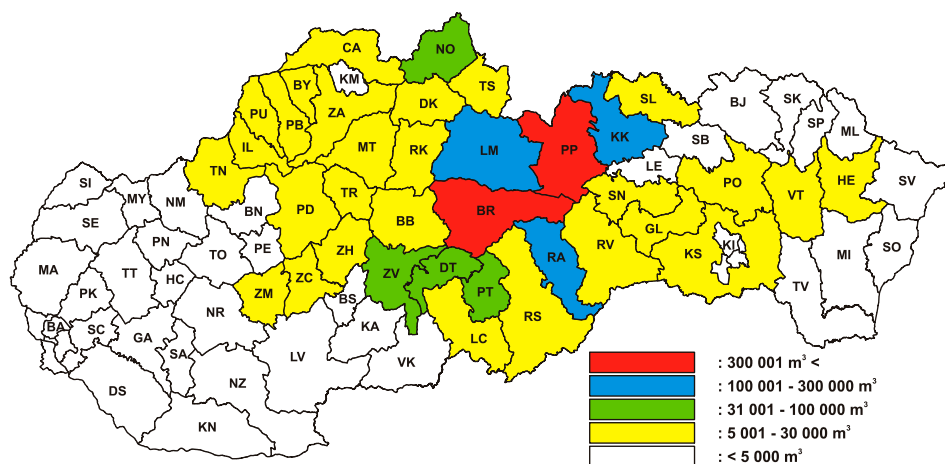


Figure 5.1–2 Snow damage by district 2006

5.2. Biotic agents

Bark beetles and wood borers

High temperatures recorded in mid altitudes of Slovakia at end April 2006 created ideal conditions for the early spring swarming of bark beetle. Abundant terminal breakage left behind the 2005–2006 snow calamities provided spruce pests with excellent breeding conditions. Snow affected areas were primarily infested by pine bark beetle; thicker branches were attacked by European spruce bark beetle and its smaller relative eight-toothed spruce bark beetle. In May and June, the bark beetle primarily attacked unsalvaged wind blowdowns left behind the November 2004 windstorm. Summer swarming started in lower altitudes in late June/early July and peaked end July. The development of beetle populations was accelerated by the above-normal temperatures recorded in July and on many sites also by unsalvaged snow blowdowns. In lower altitudes, the third swarming in September was observed. This swarming was associated with the above-normal temperatures and a lack of precipitation. In addition, substantial swarming of northern bark beetle was also observed in the same month. In autumn, favourable weather conditions provided bark beetle, regardless of the altitude, enough time to complete their development and prepare for next year spring swarming, for which majority of insect overwinter in the imago form. 2006 witnessed a number of new wind blowdowns, very often on sites affected by November 2004 calamity. Wind throw and breakage were fast attacked by bark beetle. Unless the timber is salvaged, the new bark beetle outbreak is projected for 2007.

Statistical figures for 2006 readily confirm the largest extent of bark beetle and wood borer infestation in recent years with 1, 344 thousand m^3 of damaged timber. Of this volume, 1, 185 thousand m^3 have already been salvaged; the remaining 159 thousand m^3 is still pending salvation.



Figure 13 European spruce bark beetle is a serious pest in spruce forests

European spruce bark beetle is the most notorious pest from the group mentioned (Table 5.2–1, Figure 5.2–1). Abundance of windthrown timber left behind after calamitous windstorm in no-intervention areas set aside for conservation represents a highly power-

Table 5.2–1 Main bark beetles, woodborers, defoliators and sucking insects 2006

Bark beetles & woodborers	Volume (m ³)			Defoliators & sucking insects	Damage scale (ha)		
	Damaged	Salvaged	To be salvaged		Mild	Serious	Total
European spruce bark beetle	1 183 501	1 032 051	151 450	Gypsy moth	2 291	3 734	6 025
Pine bark beetle	136 415	129 131	7 284	<i>Boarmia</i> and a shoot moth sp.	2 167	7	2 174
Conifer ambrosia beetle	4 261	4 261	0	Cockchafer (imago and grub)	105	17	122
Pine shoot beetle and other similar species	6 459	6 303	156	Aphids	630	19	649
European oak bark beetle	5 481	5 481	0	<i>Cephalcia abietis</i> (L.)	112	0	112
Large pine weevil	12	12	0	Pine sawfly	38	0	38
Northern bark beetle	—	—	—	Pale Tussock	300	18	318
Other species	8 095	7 861	234	Other species	3	0	3
Total	1 344 224	1 185 100	159 124	Total	5 646	3 795	9 441

Source: NFC-FRI Zvolen (Form L 116)

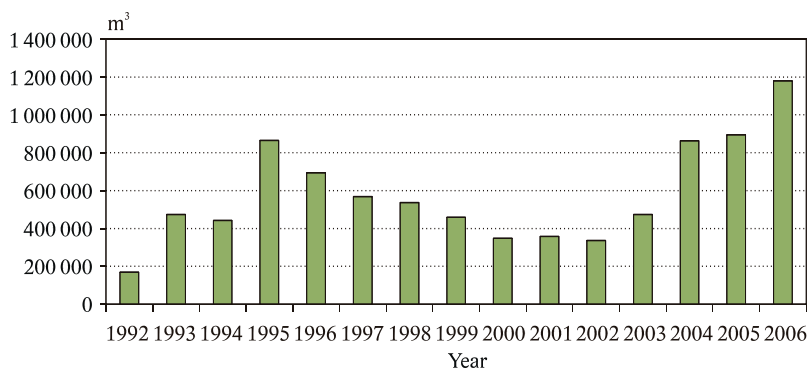


Figure 5.2–1 Forest damage by European spruce bark beetle

ful resource of bark beetle infestation, full force of which will be felt in 2007. Sites most at risk include particular sections of Tichá and Kôprova Valleys (TANAP) where bark beetle will primarily attack edges of damaged forest stands and adjacent stands. The situation will remain critical also in other parts of the Tatra NP (TANAP) where calamitous outbreaks of bark beetle attacking stand edges and remnants of standing stands have become a reality. Larch bark beetle *Ips cembrae* has also been recorded in the area. It attacks larch seed trees left standing after the calamitous windthrow disturbance. A number of arolla pine specimens in the Tatra Mts. villages have been infested by European spruce bark beetle.

In recent years, allochthonous northern bark beetle *Ips duplicatus* has started to spread across north-western Slovakia. Monitoring efforts to keep this pest under control focused on 70 organizations of the region with 418 pheromone traps installed locally. Trap investigation confirmed almost 61 thousand imagos of this invasive quarantine pest. For the immediate future, the recommendations were conveyed to step up protection measures in selected stands of top risk areas and replace single monitoring by more effective pheromone traps. At the same time, it was suggested to continue with the pest monitoring in the regime and extent of 2006.

Leaf-eating and sucking insect

Similarly to previous years, the most significant damage was caused by gypsy moth (Table 5.2–1). Despite this fact, its outbreak has now reached its peak and for the near future a serious population decline is projected. Damage associated with oak pests Tortrix moth (*Tortricidae*), mottled umber *Erannis defoliaria*, and winter moth *Operophtera brumata* was in 2006 negligible. In more than a decade, pine sawfly *Diprion pini* and *Neodiprion sertifer* has kept a low profile in Slovak forests. Species *Rhyacionia buoliana* has become a regular pest in the forests of Záhorie.

Increase in the presence of *Dreyfusia nordmanniana* sp., which regularly occurs in fir thickets of mountain regions, was also observed. Aphid species larch woolly adelgid *Adelges laricis* and *Sacchiphantes viridis*, sucking on larch and spruce, have since 2000/2001 annually caused substantial damage in larch thickets. Their incidence is often calamitous and is accompanied by the local/group dieback of forest on sites around Slovenská Lupča, Beňuš, and Kriváň.

Spruce web-spinning sawfly *Cephalcia abietis*, horse chestnut leaf miner *Cameraria ohridella*, browntail moth *Euproctis chrysorrhoea*, and fall webworm *Hyphantria cunea* were in 2006 considered pests of primarily local importance. In Záhorie region in particular, imago and larvae of cockchafer *Melolontha sp.* appeared to be a serious problem. The area of forest at risk is estimated at 300–500 hectares.

Fungi pathogens and diseases

In 2006, forestry practitioners were most concerned about a continuing decline of sprucewoods associated with honey mushroom *Armillaria ostoyae* damage (Table 5.2–2, Figure 5.2–1). Growth in the area of affected forests was, similarly to previous years, most apparent in the regions of Kysuce, Orava, the High Tatra Mts, Spišská Magura Mts., Spiš and Slovenské rudohorie Mts. The dieback was further accelerated by unfavourable climatic conditions in the second half of the vegetation period, particularly extremely high summer temperatures followed by deficit rainfall in July.

Table 5.2–2 Volume of timber damaged by fungi pathogens 2006

Pathogen	Damaged	Salvaged	To be salvaged
	(m ³)		
Rots	28 010	26 938	1 072
Fungus-borne vascular diseases	19 402	19 034	368
Needle casts	1 805	1 805	0
Canker	489	489	0
Honey mushroom	336 861	294 832	42 029
Unknown	217	196	21
Other	1 700	1 700	0
Total	388 484	344 994	43 490

Source: NFC-FRI Zvolen (Form L 116)

From the economic point of view, the increase in the incidence of dothichiza canker of poplar caused by *Cryptodiaporthe populea* was considered significant, particularly in the area of Podunajská nížina Lowland (part of the Pannonian Lowland). Compared to previous years, no changes in the decline of Austrian pine forests caused by shoot blight

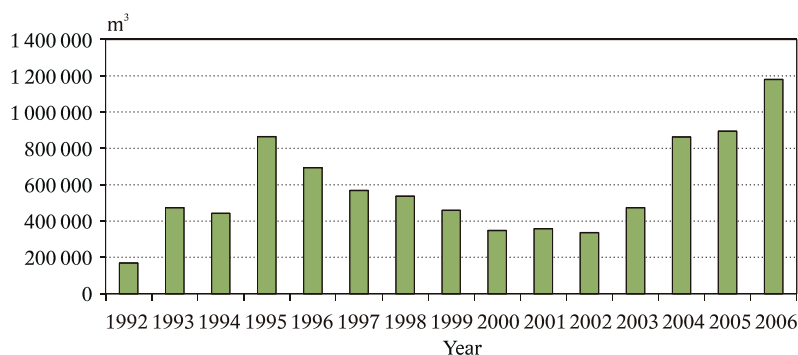


Figure 5.2–1 Volume of timber damaged by honey mushroom

and canker pathogen *Sphaeropsis sapinea* were observed. The local dieback of alder at FE Liptovský Hrádok, FD Malužiná, associated with fungal pathogen *Phytophthora* spp. and first observed in 2005, has continued. In addition, another pathogen – *Phytophthora alni* Brasier & S.A. Kirk subsp. *multiformis* Brasier & S.A. Kirk, was identified in the area. It is a very destructive pathogen of riparian *Alnus* trees that spreads fast across Europe. On the Zobor site, a localised focus of the quarantine pathogenic fungus chestnut blight fungus *Cryphonectria parasitica* (Murril) Roan. (*Ascomycotina*, *Hypocreales*, *Hypocreaceae*) was recorded in a local sweet chestnut grove.

Game

The loss of forest revenue caused by game damage went between 1991 (24,501 thousand SKK) and 1999 (6,262 thousand SKK) downward with the minimum loss being experienced in the latter year. The trend was reversed in 1999 and since then the loss has gradually grown to reach 9,097 thousand SKK in 2006. The reduced area of young forest stands damaged or destroyed by game was 732 hectares; the total financial loss was estimated at 5,765 thousand SKK. The damage to older forest stands was recorded on the reduced area of 159 hectares; the loss of income was estimated at 3,333 thousand SKK. Numbers of shot deer specimens represent a good relative indicator of its actual numbers and fairly accurately emulate long-term trends in game damage. The minimum number of shot deer specimens (<10 thousand) was recorded in 1999 and 2000. Since 2001, the numbers have been rising to reach 12 thousand in 2004 and 14 thousand the year after. A similar trend has in recent years been observed in numbers and shot specimens of mouflon and fallow deer. For the reasons mentioned, the scale of forest damage by game is projected to rise in the coming years.



Figure 14 Illegal logging remains to be a problem

5.3. Anthropogenic agents

From the group of anthropogenic agents, the prime position is occupied by groundlevel air pollution. The volume of timber felled in 2006 due to pollution damage amounted to 178 thousand m³ of which 89 percent was spruce timber. The damage was most apparent in the district of Gelnica (46 percent of the volume of damaged timber).

Table 5.3–1 Volume of timber damaged by anthropogenic agents

Agent	Damaged	Salvaged	To be salvaged
	(m ³)		
Groundlevel air pollution	214 293	178 416	35 877
Forest fires	4 707	4 552	155
Timber theft	11 842	11 842	0
Unknown	981	981	0
Other	5 740	5 740	0
Total	237 563	201 531	36 032

In 2006, 237 forest fires were recorded in Slovak forests of which 36 occurred in the areas previously damaged by windthrow. Fires were attributed to the following events: manipulation with open fire (55 percent); arsoning (20 percent); uncontrollable waste burning (10 percent); anew fire ignition (5 percent); unknown causes (5 percent); other (5 percent). As for forest fire statistics by district, the District of Poprad came first with the total of 25 fires on 8.44 hectares. It was followed by Kežmarok District with 5 fires on 12.36 hectares and Brezno District with 6 fires on 3.58 hectares.



6. MANAGEMENT OF FOREST RESOURCES

6.1. Gene pool and reproductive material

6.1.1. Inspection of reproductive material

Practical aspects of the inspection of forest reproductive material (FRM) are chiefly covered by NFC through its specialised Centre for the Inspection of Forest Reproductive material. The inspection is carried out consistent with Act No 217/2004 Coll on forest reproductive material. In addition, respective bodies of state forestry and game management administration (Chapter 11.1.) assume responsibility for state inspection of FRM (§ 29 of the cited act). In 2006, the inspections mostly focused on the management of forest seed sources, production of reproductive material of forest tree species (seed collection and processing – 67 subjects; production of planting material – 180 subjects), seed quality (a specialised seed laboratory accredited by ISTA conducted: germination tests on 153 samples; purity tests on 111 samples; vitality tests on 80 samples; water content test on 1 sample). and the implementation of rules on horizontal and vertical transfer of FRM (80 inspected subjects).



Figure 15 Demand for potted transplants grows

The Centre also managed the central register of seed sources, register of FRM licence holders, register of reproductive material producers, and the central register of reproductive material. In addition, the Centre organised the 5th international seminar called *Contemporary Aspects of Forest Nursery. Seed Management and Artificial Forest Regeneration 2006*, which was held in Liptovský Mikuláš on March 22 – 23 2006. Its 159 participants came from various areas of forestry and game management and included representatives of research, state administration and forestry practice.

6.1.2. Sources of forest reproductive material

High quality FRM is the main prerequisite of forest planting successfulness. Consistent with generally binding regulatory provisions, such material can be obtained only from the approved sources, which include seed trees and clones; seed orchards; seed stands; approved stands of A & B phenotype category; identified sources; and gene reserve forests.

The Centre for the Inspection of Forest Reproductive material consistent with the provisions of Act No 217/2004 Coll verifies the quality of potential FRM sources and supplies documentation on sources put forward for the approval. District forest offices, the bodies of state inspection, have delegated power (Act No 217/2004 Coll) to decide on the establishment or closure of a particular FRM source. As soon as the final decision is enforced, the FRM sources are considered approved.

Plus trees (ST) are selected on the quality basis. In recent years, the resilience against harmful agents has also been considered. At present, the preference is given in selection to noble hardwoods used to increase a current number of new seed orchards of these species.

Seed orchards (SO) are purpose plantations set up to produce high quality seed and secure rich, regular and easily accessible seed crop. In recent years, a number of European larch and Scots pine orchards have been closed due to their long-term surplus. Quite the opposite is the situation in noble hardwoods seed orchards of which many new are being established. Seed stands (SS) are progeny of biologically and commercially most valuable populations of forest tree species. Their area has remained stable over the last few years and new stands are unlikely to be established in the foreseeable future.

Table 6.1.2–1 Number and area of plus trees, seed orchards and seed stands

Species	Plus trees		Seed orchards			Seed stands	
	pcs	%	No	ha	%	ha	%
Spruce	252	6.0	3	3.0	1.6	282	36.2
Fir	162	3.8	1	2.3	1.2	90	11.6
Pine	824	19.6	24	56.9	30.5	55	7.1
Larch	892	21.2	37	97.7	52.3	47	6.0
Black pine	32	0.8	3	8.8	4.7	—	—
Arolla pine	—	—	4	6.3	3.4	—	—
Other conifer	320	7.6	1	0.3	0.2	—	—
Oak	510	12.1	2	3.0	1.6	120	15.4
Beech	40	0.9	—	—	—	184	23.7
Sycamore	138	3.3	2	1.7	0.9	—	—
Ash	206	4.9	3	2.8	1.5	—	—
Alder	161	3.8	1	1.0	0.5	—	—
Lime	103	2.4	1	1.5	0.8	—	—
Wych elm	142	3.4	1	0.5	0.3	—	—
Birch	—	—	1	0.4	0.2	—	—
Other broad-leaf	430	10.2	1	0.5	0.3	—	—
Total	4 212	100	85	186.7	100	778	100

Source: NFC-FRI Zvolen, 2007

Forest stands of the phenotype category A & B are approved as FRM sources on the basis of the proposal submitted by respective forest manager. Their area interannually slightly varies. Forest owners and tenurers more prefer approved stands (AS) of the B category as no management restrictions apply in this category.

Table 6.1.2–2 Area of approved stands by category and tree species

Species	Category area (ha)		Total
	A	B	
Norway spruce	3 377	15 225	18 602
Silver fir	421	3 938	4 359
Scots pine	356	2 360	2 716
European larch	144	902	1 046
Oak spp.	540	7 014	7 554
Common beech	2 191	22 597	24 788
Other species	117	948	1 065
Total	7 146	52 984	60 130

Source: NFC-FRI Zvolen, 2007

Gene reserve forests (GRF) are designated to ensure *in-situ* protection of forest gene sources. As at December 31 2006, the Centre for the Inspection of Forest Reproductive Material registered 95 GRFs. These forests covered the area of 28 953 hectares. Ten GRFs of the State Forests TANAP with the total area of 3 780 hectares shall be reassessed during the 2007 FMP review.

At the end 2006, the Forest Seed Bank stored 722.9 kg of seeds consisting of 300 units of six conifer species. Owing to decreased quality of seed units stored in the older bank compartments, the proposal for the disposal of 142 units with the total weight of 303.5 kg was drafted last year. The exact method of seed disposal is yet to be decided.

6.1.3. Forest seed management

Majority of forest tree species seeds are processed and stored by the State Forests of the Slovak Republic, s.e., Banská Bystrica, the Forest Enterprise (FE) Semenoles Liptovský Hrádok. A certain amount of seed stock is also stored in leased facilities or the facilities of particular forest management organizations.

As a result of serious seed crop failure in 2004–2005, the spring of 2006 brought a high demand for quality seed. After the seed distribution, there was very little left in storage compartments of FE Semenoles and other forest management organizations with own storing capacities.

2006/2007 season produced medium to good seed crop, particularly of beech mast for which sufficient stock was amassed. The following Table provides figures for the seed stock stored to December 31 2006. Collection of spruce, larch and pine seeds continued to early months of 2007 and thus the figures stated in the Table do not match the actual volume of seed available.

Table 6.1.3–1 Forest seed stock and its comparison with optimal stock

Indicator	Tree species (kg)						
	Spruce	Larch	Pine	Dwarf pine	Fir	Beech	Oak
FE Semenoles stock	1 220	750	764	73	3 094	43 396	14 514
– out of which leased storage	611	140	209	35	30	481	—
Stock of other owners	460	93	137	9	925	18 745	3 533
Total stock	1 680	843	901	82	4 019	62 141	18 047
Optimal stock	2 037	1 163	1 591	90	5 580	61 660	unspecified
Difference	-357	-320	-690	-8	-1 561	481	

Source: NFC-FRI Zvolen, 2007, *State Forests of the Slovak Republic, s.e., Banská Bystrica, FE Semenoles Liptovský Hrádok*



Figure 16 Seed quality is tested at the NFC accredited laboratory in Liptovský Hrádok

6.1.4. Forest nurseries

As at 31 December 2006, the Centre for the Inspection of Forest Reproductive Material registered the following number of different FRM licence holders: 298 natural persons, 142 legal entities and 44 natural persons holding the licence on behalf of other natural persons. 166 applications were received for the registration of planting stock by August 31, 2006.

In 2006, the declining trend in both total nursery area and their actual production area observed in the state sector in previous years further continued. This fact was caused by ongoing restructuring of nursery and seed production operations. The similar trend is also observed in the state managed production of transplants. In the non-state sector, on the other hand, a moderate increase in the production area and transplant stock was recorded.

Table 6.1.4–1 Total nursery area, production area and transplants volume

Indicator	2001	2002	2003	2004	2005	2006
Total nursery area (ha)						
State sector	484	600	521	520	485	453
Non-state sector	626	198	167	160	138	170
Total	1 110	798	688	680	623	623
Production area (ha)						
State sector	329	381	360	350	343	315
Non-state sector	435	151	116	119	100	123
Total	764	532	476	469	443	438
Transplant stock (thousand pcs)						
State sector	113 802	149 731	120 232	111 582	91 649	85 364
Non-state sector	73 895	64 816	50 538	61 027	59 751	67 947
Total	187 697	214 547	170 770	172 609	151 400	153 311

Source: NFC-FRI Zvolen, 2007

6.2. Silviculture

6.2.1. Forest regeneration

The total extent of forest regeneration including both natural and artificial regeneration has been gradually decreasing. Thanks to the increased implementation of shelterwood system in forests, the rate of natural regeneration has risen from less than 10 percent in 1991–2000 to 33.9 percent in 2005 and 40.5 percent in 2006. The 2006 figures on the scale, particular method and trends in forest regeneration are given in Tables 6.2.1–1, 6.1.1–2 and 6.1.1–3.



Figure 17 Sound timing of particular phases of shelterwood cutting enhances natural regeneration

Table 6.2.1–1 Forest regeneration (ha)

Regeneration 2006	State organizations	Non-state subjects	Total
Non-stocked forest land in early 2006	11 518	8 084	19 602
Total area increment in 2006 of which	12 461	5 907	18 368
– felling	10 516	5 032	15 548
– failed regeneration	829	704	1 533
– area resulting from § 6 section 7	141	41	182
– natural disasters	51	79	130
– natural regeneration excluding felling area	885	30	915
– other causes	39	21	60
Total area loss in 2006, of which	9 593	6 188	15 781
– artificial regeneration	5 185	4 071	9 256
– natural regeneration	4 234	2 071	6 305
– other causes (District Office decision)	174	46	220
Non-stocked forest land in late 2006	14 386	7 803	22 189
– of which approved exceptions	882	462	1 344

Source: *Compendium of Slovak Forestry Statistics (SFMP, PFI), 2007*

Table 6.2.1–2 Regeneration type (ha)

Non-stocked forest land decrease	New regeneration		Repeated regeneration	Total
	Planting/ sowing	Underplanting/ undersowing		
Artificial regeneration	7 284	189	1 783	9 256
Natural regeneration	5 369	902	34	6 305
Total	12 653	1 091	1 817	15 561
Other causes (District Office decision)	195	16	9	220
Total	12 848	1 107	1 826	15 781

Source: *Compendium of Slovak Forestry Statistics (SFMP, PFI), 2007*

Table 6.2.1–3 Trends in forest regeneration (ha)

Regeneration type	1990	2000	2005	2006
Artificial regeneration	15 500	12 923	8 922	9 256
Natural regeneration	3 464	2 134	4 582	6 305
Total	18 964	15 057	13 504	15 561
Natural regeneration (%)	18.2	14.2	33.9	40.5

Source: *Compendium of Slovak Forestry Statistics (SFMP, PFI)*

6.2.2. Treatment of young forests

Brush cutting and cleaning were implemented on the total area of 11, 348 hectares of which 8, 151 hectares were in state tenure forests; the remaining 3, 197 hectares were forests in non-state tenure. Figures illustrating the scale of young plantation protection are given in Chapter 6.5.2.

6.2.3. Young forest cleaning

In 2006, the cleaning operations were not realised on the entire area planned. Similarly to 2005, this fact was caused by a significant non-compliance with the operation volume planned for the category of non-state forests.

Table 6.2.3–1 Area of planned and realised cleaning

Cleaning	State organizations	Non- state subjects	Total
Planned	17 317	12 577	29 894
Realised	19 634	8 749	28 383
Planned-realised rate in %	113.4	69.7	94.9

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI), 2007

Table 6.2.3–2 Trends in planned and realised cleaning

Cleaning	1990	2000	2005	2006
Planned	33 994	34 668	30 743	29 894
Realised	34 143	34 936	29 079	28 383
Planned-realised rate in %	100.4	100.8	94.6	94.9

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI)

6.2.4. Thinning

In 2006, thinning operations were carried out on the area 11, 284 hectares smaller than planned. The reduction in the operations scale was observed in both state (down by 4, 025 hectares) and non-state (down by 7,259 hectares) forests. This development was chiefly associated with the postponement of planned intermediate felling due to timber salvage operations in mature and premature forest stands. The volume of actual intermediate felling has been long-term higher than planned due to a high rate of incidental felling.

Figures on the scale and trends in planned and realised thinning are shown in Tables 6.2.4–1 and 6.2.4–2.

Table 6.2.4–1 Planned and realised thinning

Thinning		State organizations	Non-state subjects	Total
Planned	ha	33 018	24 832	57 850
Realised		28 993	17 573	46 566
Planned-realised rate	%	87.8	70.6	80.5
Planned	m ³	759 910	525 005	1 284 915
Realised		1 292 156	871 464	2 163 620
Planned-realised rate	%	170.0	166.0	168.4

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI), 2007

Table 6.2.4–2 Trends in planned and realised thinning

Thinning		1990	2000	2005	2006
Planned	ha	63 397	61 111	58 318	57 850
Realised		37 143	53 938	46 070	46 566
Planned-realised rate	%	58.6	88.2	79.0	80.5
Planned	m ³	1 190 418	1 220 469	1 284 554	1 284 915
Realised		1 896 279	1 926 010	2 163 218	2 163 621
Planned-realised rate	%	159.3	157.8	168.4	168.4

Source: *Compendium of Slovak Forestry Statistics (SFMP, PFI)*

6.3. Use of silvicultural systems

In comparison to 1990, an increase in the planned rate of shelterwood system forms (small-scale & large-scale shelter cuts) has been recorded with the current rate stabilised at around 60 percent. Actual implementation of the system on the whole area planned is mainly hampered by a long-term high rate of incidental felling. At the same time, a rise in the area of purpose-made cut (applied in protective and special-purpose forests) and a decrease in the clearcut area have been reported.



Figure 18 Protection forests in the spruce altitudinal vegetation zone are primarily managed using purpose-made cut

The shelterwood system prevails in commercial and special-purpose forests; in protective and special-purpose forests with suitable natural and stand conditions, gentler purpose-made selection or common selection system are preferred to maintain their special functions.

Table 6.3–1 *Silvicultural systems and their forms entered in FMPs*

Silvicultural system	Forms	1990		2000		2005		2006	
		Felling area	Σ stand	Felling area	Σ stand	Felling area	Σ stand	Felling area	Σ stand
		%							
Clearcut	Small-scale	55.5	52.1	26.9	28.0	24.3	25.0	24.2	24.8
	Large-scale	9.2	7.9	2.2	2.4	10.1	6.5	9.8	6.3
	Transformation	0.9	1.2	0.7	0.6	0.5	0.4	0.5	0.4
	Conversion	2.3	2.1	0.3	0.4	1.0	0.8	0.9	0.7
	Shelterwood-clearcut combination	16.6	15.6	—	—	—	—	—	—
	Total	84.5	78.9	30.1	31.4	35.9	32.7	35.4	32.2
Shelterwood	Small-scale	7.1	6.1	49.2	41.3	42.8	38.3	43.4	39.0
	Large-scale	0.8	0.7	8.0	8.1	7.6	6.8	8.2	7.3
	Overstorey removal cut	6.2	8.8	10.9	11.9	11.2	12.8	10.1	11.5
	Total	14.1	15.6	68.1	61.3	61.6	57.9	61.7	57.8
Selection and purpose-made cut	Tree and group selection	1.4	5.5	1.8	7.3	2.5	9.4	2.9	10.0

Source: *Compendium of Slovak Forestry Statistics (SFMP, PFI)*

Legend: Σ stand – a number of stands with a prescribed silvicultural

Table 6.3–2 *Silvicultural systems entered in FMP by functional forest category*

System	Functional forest category					
	Commercial		Protective		Special-purpose	
	Felling area	Σ stand	Felling area	Σ stand	Felling area	Σ stand
	%					
Clearcut	35.4	34.7	18.7	6.2	28.1	25.4
Shelterwood	62.8	63.3	11.8	8.0	63.1	54.3
Selection and purpose-made	0.2	0.7	69.0	85.6	8.6	20.2

Source: *Compendium of Slovak Forestry Statistics (SFMP, PFI), 2007*

Legend: Σ stand – a number of stands with prescribed silvicultural system

6.4. Felling operations

6.4.1. Timber felling

The annual volume of felled timber has long-term increased with 8.4 million m³ of timber felled in 2006; when compared to 1990 the volume rose by 58.4 percent. However, when compared to 2005, the volume actually fell by 18 percent. The volume of timber felled in 2005 was nevertheless highly abnormal. This fact was caused by salvage of large-scale windthrows from November 2004. Split down by species structure, 5.2 million m³ were conifer timber; the remaining 3.2 million m³ were the timber of broad-leaf species. As in a number of previous years, the forest sector was again plagued by a high rate of incidental felling contributing to significant changes in planned forest management measures. The 2006 incidental-total felling volume rate was 51.1 percent; in conifers, though, this rate

reached 74.4 percent. The actual volume of incidental felling topped the total planned felling volume by almost 19 percent.

Table 6.4.1–1 Realised felling volume

Volume thousand m ³		1990	2000	2005	2006
Conifer	Total	2 777.0	3 245.0	6 927.4	5 150.0
	of which incidental	1 838.0	2 012.0	6 152.7	3 831.0
	% of incidental felling	66.2	62.0	88.8	74.4
Broad- leaf	Total	2 499.0	2 973.0	3 263.1	3 207.2
	of which incidental	766.0	1 010.0	380.3	435.0
	% of incidental felling	30.7	34.0	11.7	13.6
Total	Total	5 276.0	6 218.0	10 190.5	8 357.2
	of which incidental	2 604.0	3 021.0	6 533.0	4 266.0
	% of incidental felling	49.3	48.6	64.1	51.0

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI)



Figure 19 Haulage sets are used as a primary means of trunk transportation

Table 6.4.1–2 Felling volume by type and tenure

Tenure	Species	Felling									
		Incidental		Regeneration		Intermediate			Total		
		Realised		Incidental		Realised	Incidental		Realised	Incidental	
		thousand m ³ of timber with d.i.b > 7 cm		%		thousand m ³ of timber with d.i.b > 7 cm		%	thousand m ³ of timber with d.i.b > 7 cm		%
State organizations	C	6.3	1 995.7	1 470.9	73.7	779.5	624.5	80.1	2 775.2	2 095.4	75.5
	B	1.9	1 478.9	169.7	11.5	512.7	96.8	18.9	1 991.6	266.5	13.4
	Σ	8.2	3 474.6	1 640.6	47.2	1 292.2	721.3	55.8	4 766.8	2 361.9	49.6
Non-state subjects	C	8.3	1 800.4	1 263.4	70.2	574.4	472.2	82.2	2 374.8	1 735.6	73.1
	B	4.3	918.6	106.0	11.5	297.0	62.5	21.0	1 215.6	168.5	13.9
	Σ	12.6	2 719.0	1 369.4	50.4	871.4	534.7	61.4	3 590.4	1 904.1	53.0
Total	C	14.6	3 796.2	2 734.3	72.0	1 353.9	1 096.7	81.0	5 150.0	3 831.0	74.4
	B	6.2	2 397.4	275.7	11.5	809.7	159.3	19.7	3 207.2	435.0	13.3
	Σ	20.8	6 193.6	3 010.0	48.6	2 163.6	1 256.0	58.5	8 357.2	4 266.0	51.0

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI), 2007

Legend: C – conifers, B – broad-leaves

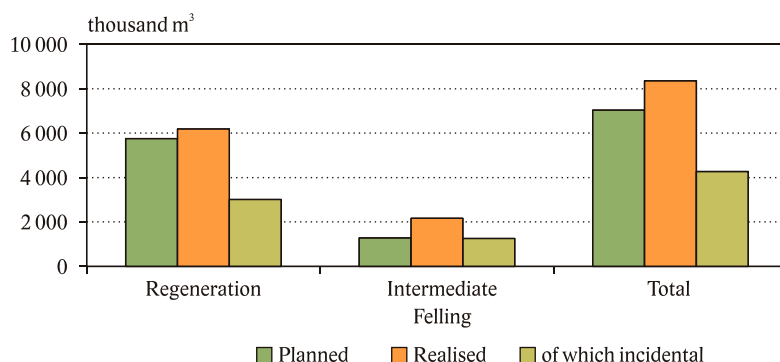


Figure 6.4.1–1 Planned and realised felling

6.4.2. Timber transportation (skidding and hauling)

In 2006, the volume of skidded timber amounted to 8.009 million m³, which was 0.348 million m³ less than the total volume of felled timber. The difference was caused by keeping a certain volume of felled calamitous timber *in-situ* in the TANAP and NAPANT national parks (the State Nature Conservancy request) and by individual small-scale timber production.

Table 6.4.2–1 Skidding operations

Organizations		Year (thousand m ³)			
		1990	2000	2005	2006
State	MA SR	4 728	3 509	5 889	4 289
	Other ministries	469	345	397	358
	Total	5 197	3 854	6 286	4 647
Non-state		0	data unavailable	3 019	3 362
Total		5 197	3 854	9 305	8 009

Source: Statistical records of the MA SR: Les V (MA SR) 2-04 and Les (MA SR) 5-01; NFC-FRI Zvolen

The following machinery was used to realise the total volume of skidding in the forests of state organizations: universal wheeled tractors 30.1 percent, horse tandem 2.6 percent, forest wheeled tractors 47.6 percent, haulage suits 15.8 percent, forest cable systems 3.9 percent, hand skidding and helicopters 0.03 percent. In comparison to 2005, an increased volume of timber was hauled by haulage suits (up by 14.9 percent). For the same period, the volume hauled by cable systems dropped by an estimated 10 percent.

Table 6.4.2–2 Structure of timber skidding realized by state organizations' own means

Skidding equipment		Year (%)			
		1990	2000	2005	2006
Horses		1.7	11.8	2.7	2.6
Portable and self-propelled winch		0.6	—	—	—
Cable systems		1.7	2.5	13.9	3.9
Tractors	Conveyor	2.0	—	0.1	—
	Universal wheeled	31.0	14.0	22.0	30.1
	Forest wheeled	63.0	68.5	62.2	47.6
Haulage suits		—	0.6	0.9	15.8

Source: Statistical records of the MA SR: Les S (MA SR) 5-01 and Les S (MA SR) 7-01; NFC-FRI Zvolen

In 2005, almost 40 percent of timber hauled by state organizations was in a full-length; the same rate for non-state subjects was down to 26.8 percent. The difference in the skidded and hauled volume of timber (1.127 million m³) represents the volume of timber on depots and distribution yards.

Table 6.4.2–3 Timber haulage

Organization		Year (thousand m ³)			
		1990	2000	2005	2006
State	MA SR	4 266	3 167	6 278	3 763
	Other ministries	469	345	490	314
	Total	4 735	3 512	6 768	4 077
Non-state		0	data unavailable	2 519	2 805
Total		4 735	3 512	9 287	6 882

Source: Statistical records of the MA SR: Les S (MA SR) 5-01 and Les S (MA SR) 9-01; NFC-FRI Zvolen

6.4.3. Forest road network

The data available put the average density of forest road network in Slovakia at 18.3 m per hectare. In 2006, the total length of forest roads increased by 6 km.

Table 6.4.3–1 Forest road network

Road type		2005		2006	
		Lenght (km)	Density (m.ha ⁻¹)	Lenght (km)	Density (m.ha ⁻¹)
Own roads	Main forest road class 1L (strengthened surface)	6 354	3.2	6 354	3.2
	Main forest road class 2L (section-strengthened surface)	14 839	7.4	14 842	7.4
	Non-strengthened 3L class road + permanent skidding road (TPC)	15 891*	7.9	15 894	7.9
	Total	37 084*	18.5	37 090	18.5
Other roads – main forest road class 1L		3 212	1.6	3 212	1.6
Total		40 296	20.1	40 302	20.1

Legend: 1L – main forest road with strengthened surface for a year-round use; 2L – main forest road with non-strengthened surface with macadam strengthened sections for a seasonal use; 3L – non-strengthened forest road constructed with main forest road parameters allowing timber haulage in favourable geological and climatic conditions; TPC – permanent non-strengthened skidding road with 20% maximum longitudinal gradient

6.5. Forest protection

6.5.1. Forest Protection Service

The Forest Protection Service (FPS) is the body of state forest protection inspection (§ 29 of Act No 326/2005 Coll on forests). Its main activities as defined in the cited act include inspection of the implementation of forest protection measures and measures implemented to improve forest condition. In addition, FPS in 2006 also conducted the monitoring of forest condition and incidence of harmful agents, drafted projections for harmful agents and issued warnings. At the same time, it carried out duties related to plant treatment in forestry consistent with Act No 193/2005 Coll on plant treatment. At last, it also provided advisory and educational services, data for the information system and carried out the evaluation of forest protection related project. Its executive power focused on measures rectifying identified shortcomings.

Figure 20 Mechanical barriers are very effective in trunk nibbling protection



6.5.2. Preventive protection measures

In 2006, preventive weed control measures were implemented on the total area of 37,411 hectares of young forest. In the same term, measures to control game damage were implemented on 30,946 hectares. These measures included the installation of 113 km of fence to protect 257 hectares of young plantations and 6 km of fence to control cattle grazing. Brush cutting and cleaning measures were implemented on 11,348 hectares.

One of the most important preventive measures related to bark beetle and wood borer control was the removal of timber from the areas affected by high winds and heavy snow (Chapter 5.1). With respect to a continuing increase in the volume of incidental felling, a timely removal of dying and dead trees is crucial to prevent spreading of bark beetle and other secondary pests and diseases. Last year, the scale of measures was largely insufficient.

Lengthy administrative procedure of the state bodies responsible for the environment when dealing with the applications for salvage of calamitous timber in protected areas, road construction, terrestrial and aerial application of insecticides, installation of pheromone traps, etc., is also one of the factors compromising the effectiveness of prevention measures against bark beetle. Formal approvals (exceptions, if applicable) issued in compliance with Act No 543/2002 Coll on nature and landscape protection were often not granted or granted too late. Delays caused by this approach have been associated with large-scale damage to both timber fallen in natural disturbances and standing, originally undamaged forest stands, attacked by bark beetle in infestation events.

6.5.3. Protection and controlling measures

In 2006, special attention was paid to the protection and controlling against bark beetle outbreaks. The measures included the installation of 8,223 traditional trap trees and 46,747 pheromone traps. The number of installed pheromone traps regionally varied as follows: Brezno District – 10,660 traps, Poprad District – 5,059 traps, Kežmarok District – 3,126 and Čadca District – 3,074 traps. In addition, 202,252 m³ of timber was treated chemically.

Overview of forest protection measures to control bark beetle and wood borer populations is given in Table 6.5.3–1.

Controlling measures against gypsy moth were implemented by NFC – FRI Zvolen. In 2006, four different chemicals were used selected on the basis of their environmental impact and selectivity properties. Of the total area of 5,538 hectares, 520 hectares (9.4 percent) were treated by a pure biological agent based on *Bacillus thuringiensis*. The remaining area of 5,018 hectares (90.6 percent) was treated using growth hormones (chitin synthesis inhibitors) with a low impact factor on non-targeted organisms and the environment (Dimilin 48 SC – 1,200 ha, Nomolt 15 SC – 2,000 ha, Rimon 10 EC – 1,818 ha). In the same period, further 300 hectares were treated against spruce and larch aphids (FE Čierny Balog, FE Slovenská Ľupča). Controlling measures applied against larch casebearer included aerial spraying on the total area of 50 hectares.

Table 6.5.3–1 Bark beetle and wood borer measures

Insect species	Trap trees (pcs)			Pheromone traps (pcs)			Chemically treated (m ³)
	Low	Moderate	Strong	Low	Moderate	Strong	
European spruce bark beetle	1 801	2 491	2 547	7 700	10 781	15 518	177 034
Pine bark beetle	360	306	158	4 702	3 359	3 812	24 912
Conifer ambrosia beetle	0	0	0	436	51	142	0
Bark beetles on pine	0	0	0	0	47	0	0
European oak bark beetle	122	200	238	0	0	0	0
Large pine weevil	0	0	0	0	0	0	0
Northern bark beetle	0	0	0	298	19	8	306
Total	2 283	2 997	2 943	13 018	14 257	19 472	202 252

Source: NFC-FRI Zvolen (Form L 116)

6.5.4. Fire control

Similarly to the past, fire control in Slovak forests was managed by the Air Fire Service (AFC) established in 2001. The scope of its current activities is regulated by MASR and MI SR Regulation No 1344/40/2003-700 of 18 February 2003 on air actions related to forest fire monitoring and suppression. Fire prevention efforts were last year jointly coordinated by AFC and the State Forests of SR, s.e. Practical aspects of terrestrial fire control were the responsibility of particular forest owners and tenurers. They had an obligation to report any identified source of forest fire to the Fire and Rescue Brigade (FRB) and by their arrival they were responsible for fire suppression measures.



Figure 21 Fire control measures in risk areas are particularly important in dry periods

In 2006, the following regulations came into force: Act No 326/2005 Coll on forests; amended Act No 314/2001 Coll on protection against fire; amended Executive Regulation No 121/2002 Coll on fire prevention. Provisions of the Act on forests oblige forest practitioners to implement preventive measures to minimise the risk of forest fires as laid down in Act No 314/2001 Coll and associated executive orders. New provisions of the Act include the obligation to conduct air fire control monitoring funded from the state budget.

The following mountain ranges have been included in the high fire risk class A: Slovenské rudohorie, Nízke and Vysoké Tatry, Belianske Tatry, Slovenský Kras, Oravská Magura, Veľká and Malá Fatra, Slovenské Beskydy, Javorníky, and Chvojnícka pahorkatina. The class B – lower fire risk, includes the following mountains and regions: Malé and Biele Karpaty, Považský Inovec, Tribeč, Strážovské vrchy, Záhorská nížina, Vtáčnik, Krupinská vrchovina, Javorie, Štiavnické vrchy, Cerová vrchovina, Vihorlat, Nízke Beskydy, Slánske vrchy, Levočské vrchy, Čergov.

6.6. Certification of sustainable forestry

6.6.1. FSC certification

In 2006, there were 162.9 thousand hectares of forest certified under the FSC system. In the same period, 21 certificates of the chain-of-custody were issued. The aforementioned system is in Slovakia represented by the FSC Slovakia association. Throughout the year, activities associated with the elaboration of the national FSC standard for the forest sector continued in a form of public presentations on the first draft proposal prepared by the National Standard Commission. In November 2006, Banská Bystrica hosted the meeting of national FSC initiatives from across Europe, on which representatives from 19 different countries of Europe discussed practical aspects of wider implementation of certification systems in the region.

6.6.2. PEFC certification

To date, an estimated 537 thousand hectares of forest have been certified under the PEFC system in Slovakia. On top of that, 3 certificates of the chain-of-custody have been issued. The certificates, validity of which is limited to 5 years, were awarded to the State Forests of SR, s.e., the sole applicant. These certificates cover forest plots of 90 state, community, municipal and private owners and tenurers. Data on the total area of certified forests are valid as at first half of 2007.



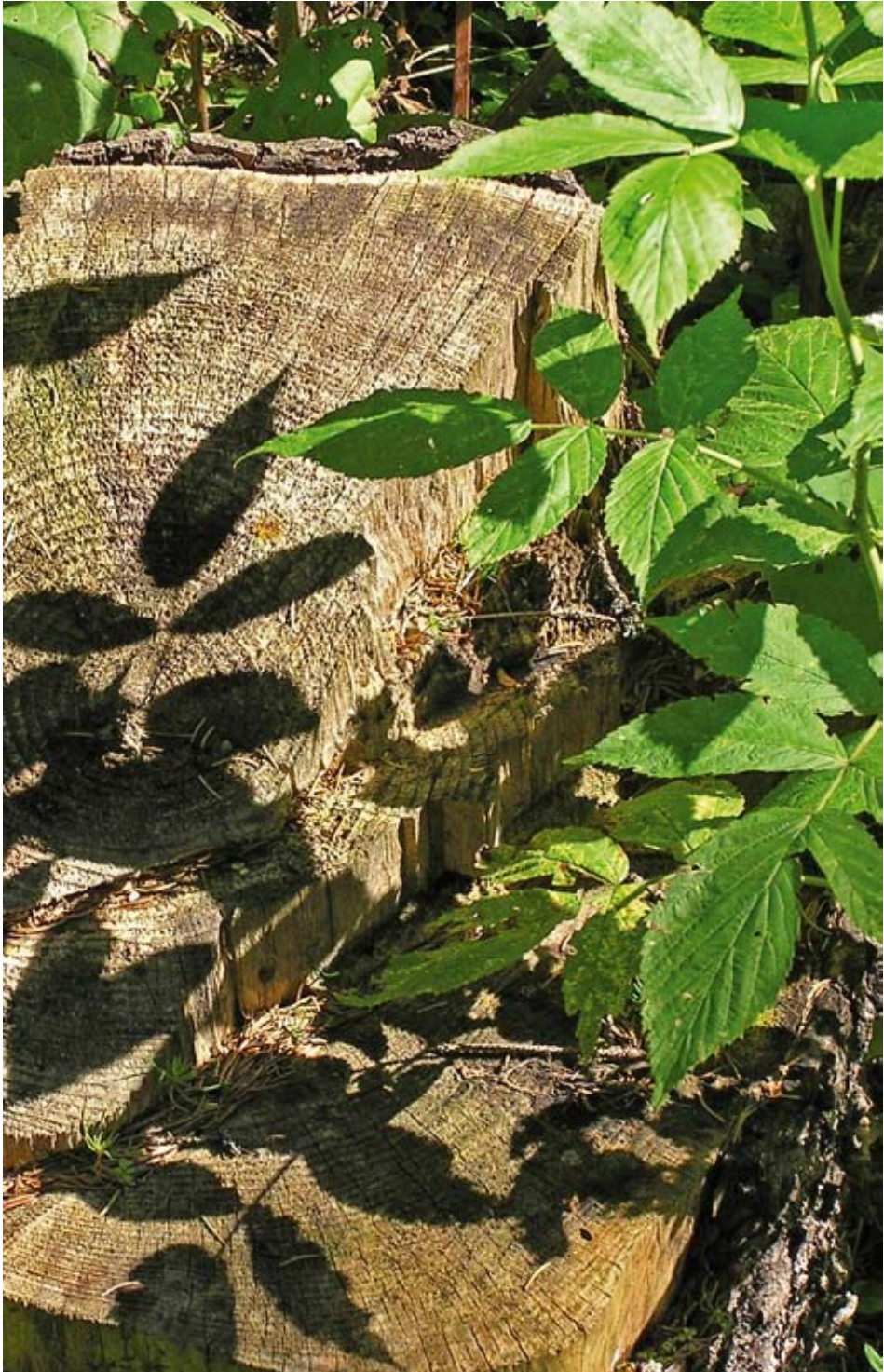
Figure 22 Certificate award confirms sustainability of forest management

6.7. Technical normalization in forestry

No new Slovak Technical Norm (STN) was issued in 2006. Based on the plan of technical normalization for 2006, issued by the Slovak Institute of Technical Normalization Bratislava (SUTN), the Technical Committee (TC) No 6 – Forestry handled the following tasks:

- elaboration of new STN 48 0030 Multi-operation technologies in forestry;
- adoption of the preliminary European Standard prEN 1309 – 2 Round and sawn timber. Method of measurement. Requirements for measurement and volume calculation rules. Final proposal has been submitted to SUTN for implementation.

Review of the STN 48 0050 Raw timber. Basic and common provisions. NFC-FRI Zvolen adapted the norm in view of the provisions of prEN 1309 – 2. Due to the discrepancy between the method of diameter measurement defined in prEN 1309-2 and Governmental Order No 86/2005 Coll on classification of raw timber, the procedure was temporarily discontinued.



7. TIMBER TRADE

Timber sales constitute the single most important source of revenue in the forest sector. Without it, the conservation of forest functions and maintenance of sectoral jobs would be hard to achieve. Timber sales provide for an estimated 80 percent of revenue and assets in the sector.

7.1. Domestic timber supply

Production of particular log grades and their supply to domestic market is regulated by STN and Governmental Order No 86/2005 Coll on classification of raw timber, both of which comply with the EC regulations and European Norms (EN) on qualitative grading of round timber issued by the European Centre for Normalization (CEN) in Brussels. In 2006, bodies managing Slovak forests supplied the domestic market with 7,353 thousand m³ of timber, the second largest volume ever supplied. This exceptionally high supply of timber was the result of the removal of remaining timber from the November 2004 windthrow. The log grade structure of supplied timber was the best since 1990. Whilst conifer sawn timber constituted 61 percent of the total volume, the same grade of broad-leaf timber accounted for 37 percent of the total supply.

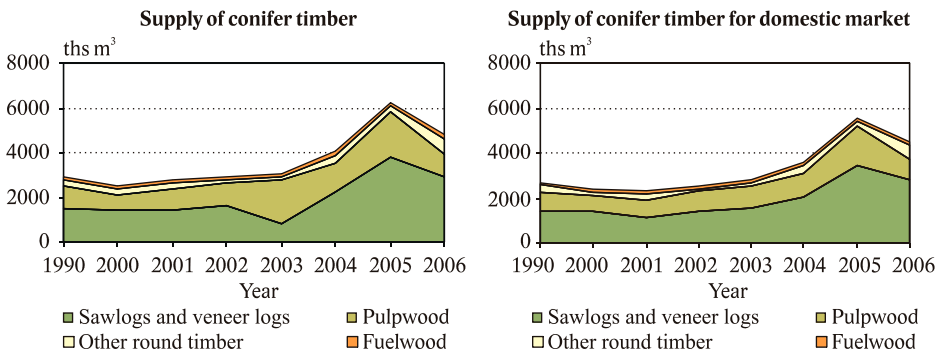


Figure 7.1–1 Supply of conifer timber in total and for domestic market

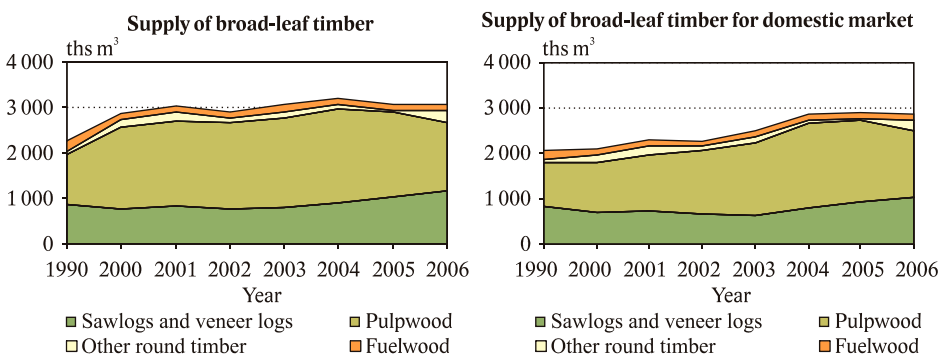


Figure 7.1–2 Supply of broad-leaf timber in total and for domestic market

Table 7.1–1 Log grade structure of raw timber supply

Grade	1990 (m³)			2005 (m³)			2006 (m³)			(%)					
	Domestic	Export	Own consumption	Total	Domestic	Export	Own consumption	Total	Domestic	Export	Own consumption	Total	1990	2005	2006
Conifer timber															
I class logs	15 210	—	—	15 210	405	145	1	551	255	52	—	307	0.61	0.01	0.01
II class logs	40 020	—	69	40 089	5 646	337	19	6 002	8 278	619	44	8 941	1.60	0.10	0.19
III A, B, C logs	1 313 463	619	27 269	1 341 351	2 793 129	214 716	72 427	3 083 272	2 805 753	45 739	71 720	2 922 762	53.44	49.53	61.08
Poles	33 740	—	—	33 740	5 643	11 938	—	17 581	558	—	—	558	1.34	0.28	0.01
Mining timber	88 744	—	11	88 755	17 206	4 141	1 187	22 534	12 166	2 352	1	14 519	3.54	0.36	0.30
Thin poles	40 229	722	1 256	42 207	45 715	11 557	189	57 461	12 042	737	293	13 072	1.68	0.92	0.27
Pulpwood	711 484	21 527	10	733 021	1 210 654	194 992	9 947	1 415 593	875 116	139 540	2 824	1 017 480	29.21	22.74	21.26
Chipwood	1 436	—	—	1 436	12 752	—	214	12 966	52 958	16 316	3	69 277	0.06	0.21	1.45
Fuelwood	132 305	—	3 067	135 372	139 358	2 117	6 654	148 129	135 983	44	6 435	142 462	5.39	2.38	2.98
Stumpage	—	—	—	—	750 181	80 805	177	831 163	307 231	768	873	308 872	—	13.35	6.45
Raw trunks	—	—	—	—	540 535	85 620	3 164	629 319	276 834	2 296	8 047	287 177	—	10.11	6.00
Round timber refuse	—	—	78 691	78 691	—	—	—	—	—	—	—	—	3.14	—	—

Table 7.1-1 – contd.

Grade	1990 (m ³)			2005 (m ³)			2006 (m ³)			(%)		
	Domestic	Export	Own consumption	Total	Domestic	Export	Own consumption	Total	Domestic	Export	Own consumption	Total
Total	2 376 631	22 868	110 373	2 509 872	5 521 224	606 368	96 979	6 224 571	4 487 174	208 463	89 790	4 785 877
Broad-leaf timber												
I class logs	27 713	—	—	27 713	4 069	1 847	—	5 916	3 106	2 339	—	5 445
II class logs	81 118	—	8	81 126	28 276	10 302	6	38 584	23 758	10 658	6	34 422
III A, B, C logs	733 612	1 372	13 001	747 985	866 690	69 625	10 065	946 380	1 002 968	97 505	29 409	1 129 882
Mining timber	2 378	—	34	2 412	20 433	816	—	21 249	4 803	213	—	5 016
Thin poles	24 245	—	648	24 893	738	—	146	884	465	—	174	639
Pulpwood	963 081	140 147	331	1 103 559	1 725 376	76 959	4 907	1 807 242	1 473 442	30 870	1 355	1 505 667
Chipwood	26 419	5 780	721	32 920	5 446	330	—	5 776	66 255	17 606	—	83 861
Fuelwood	224 393	—	8 778	233 171	140 425	600	7 856	148 881	147 912	7 799	8 902	164 613
Stumpage	—	—	—	—	88 627	—	260	88 887	109 747	—	9 411	119 158
Raw trunks	—	—	—	—	13 550	—	209	13 759	33 374	—	1 005	34 379
Round timber refuse	—	—	25 079	25 079	—	—	—	—	—	—	—	—
Total	2 082 959	147 299	48 600	2 278 858	2 893 630	16 0479	23 449	3 077 558	2 865 830	166 990	50 262	3 083 082
ΣConifer + broad-leaf	4 459 590	170 167	158 973	4 788 730	8 414 854	766 847	120 428	9 302 129	7 353 004	375 453	140 502	7 868 959
Conifer sawn timber	—	—	—	—	57 886	7 740	1271	66 896	10 165	—	951	11 116
Broad-leaf sawn timber	—	—	—	—	1 360	1 302	364	3 026	11 788	2 495	11	14 294

Source: Quarterly record on the timber supply in the forest sector Les D (MA SR) 2-04, Slovak customs statistics, NFC-FRI Zvolen data

Note: The export volume includes only the timber delivered directly by owners (tenurers) of forests. Differences between the volume of timber supply and actual sale is caused by the adjustment of sawn timber volume not included in the sale volume. Sawn timber is adjusted to fit log grade quality classes I – IV using the coefficients of 0.65 for conifers and 0.70 for broad-leaves. The volume of sawn timber delivered to the domestic market is added to the volume of log grades sold on the market. The volume of sawn timber for export is added to the volume of export log grades. Delivery volumes also include the timber used for the production of sawn timber for private consumption.

7.2. Timber export & import

In 2006, exports amounted to 1, 233 thousand m³ of timber. Private owners and tenurers contributed to these exports by 375 thousand m³, which split down by particular types represented 208 thousand m³ of conifer and 167 thousand m³ of broad-leaf timber. The remaining volume – 858 thousand m³, was the volume exported by other organizations, commercial enterprises in particular. Forestry subjects last year exported less than a half (47 percent) of the volume sold in 2005. Commercial non-forest subjects, however, for the comparable period recorded only 15 percent drop on the 2005 export figures.



Figure 23 Conifer timber, spruce in particular, forms a major part of timber deliveries

Table 7.2–1 Export of raw timber grades

Grade	Volume (thousand m ³)		Rate (%)	
	2005	2006	2005	2006
Conifer logs (quality class I–III)	767	285	42.3	23.1
Conifer timber quality class IV–V	605	391	33.3	31.7
Broad-leaf logs (quality class I–III)	111	218	6.1	17.7
Broad-leaf timber quality class IV–V	208	324	11.5	26.3
Fuelwood	124	15	6.8	1.2
Total	1 815	1 233	100	100

Source: Statistical Office SR

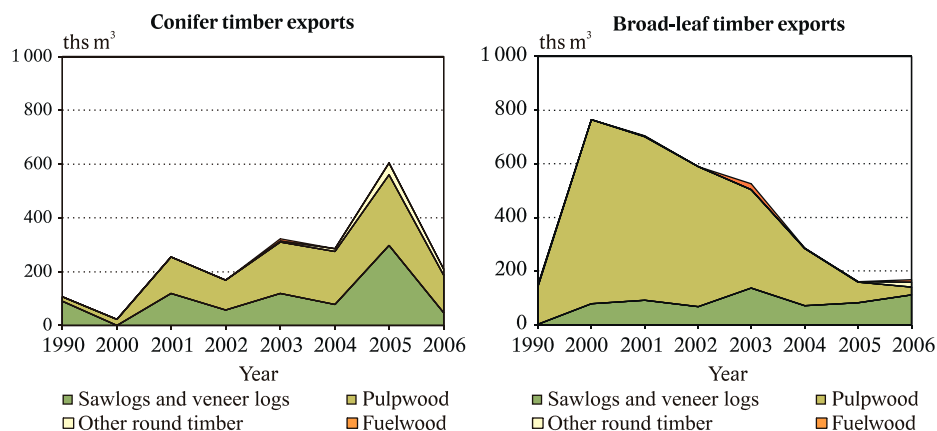


Figure 7.2–1 Conifer and broad-leaf exports by forestry subjects

Source: Quarterly record on timber supply in forest sector Les D (MA SR) 2-04, MI statistics, Statistical Office SR, NFC-FRI Zvolen

Exports started to decline in 2000. The trend changed in 2005, when these climbed up to 1, 815 thousand m³ as a result of salvage of timber from the 2004 windthrow. In 2006, wood processors and commercial enterprises exported the total of 1 092 thousand m³ of conifer and 98 thousand m³ of broad-leaf sawn timber. In the same term, forestry subjects sold abroad only 2 thousand m³ of broad-leaf sawn timber.

Table 7.2–2 Import of raw timber grades

Grade	Volume (thousand m ³)		Rate (%)	
	2005	2006	2005	2006
Conifer logs (quality class I–III)	2	3	3.0	0.9
Conifer timber quality class IV–V	—	—	—	—
Broad-leaf logs (quality class I–III)	5	51	7.5	14.6
Broad-leaf timber quality class IV–V	55	286	82.0	81.7
Fuelwood	5	10	7.5	2.8
Total	67	350	100	100

Source: Statistical Office SR

7.3. Timber consumption

Figures given in Table 7.3–1 indicate a substantial growth in the production and consumption of main raw timber grades.

Table 7.3–1 Production and consumption of timber per capita

Grade	1990	2000	2005	2006
	m ³ per capita			
Round timber – production	0.865	1.082	1.729	1.463
Round timber – consumption	0.837	0.805	1.403	1.299
Industrial round timber – production	0.800	0.943	1.289	1.405
Industrial round timber – consumption	0.771	0.751	1.370	1.242
Pulpwood – production	0.343	0.488	0.671	0.469
Pulpwood – consumption	0.310	0.360	0.546	0.344

Source: Quarterly record on timber supply in forest sector Les D (MA SR) 2-04, MI statistics, Statistical Office SR, NFC-FRI Zvolen

7.4. Domestic & foreign timber prices

The volume of timber sold in Slovakia interannually decreased by almost 12.9 percent. The decrease was primarily caused by a lower availability of conifer timber, exports of which were 18.9 percent down on 2005; the volume of broad-leaf timber for the comparable period fell only by 1 percent. Exports of log grades realized by forestry subjects were a staggering 50.6 percent down on the 2005 figures. This drop was associated with the lower volume of marketed conifer grades. On the other hand, the volume of broad-leaf grade exports slightly increased (Table 7.4–1).

Table 7.4 – 1 Sale and average prices of log grades 2006

No.	Grade	Sale (m³)		Average price (SKK/m³)		Total revenue (SKK)				
		Domestic	Export	Domestic	Foreign	Domestic	Export	Total		
Conifer timber										
1	I class logs	255	52	307	3 771	3 675	3 754	961 497	191 101	1 152 598
2	II class logs	8 322	619	8 941	3 135	3 191	3 139	26 089 086	1 975 478	28 064 563
3	III A, B, C class logs	2 859 483	52 245	2 911 728	1 741	1 607	1 739	4 978 584 736	83 932 403	5 062 517 139
4	Poles	558	—	558	2 040	—	2 040	1 138 190	—	1 138 190
5	Mining timber	12 166	2 352	14 518	1 301	1 187	1 283	15 830 172	2 791 824	18 621 996
6	Thin poles	12 177	737	12 914	789	1 012	802	9 613 647	745 844	10 359 491
7	Pulpwood	875 629	139 540	1 015 169	875	899	878	766 275 713	125 426 847	891 702 560
8	Chipwood	52 961	16 316	69 277	1 223	1 223	1 223	64 770 903	19 954 468	84 725 371
9	Fuelwood	135 983	44	136 027	444	388	444	60 423 163	17 072	60 440 235
10	Σ 1 – 9	3 957 534	211 905	4 169 439	1 497	1 109	1 477	5 923 687 106	235 035 037	6 158 722 143
11	Conifer stumpage	307 231	768	307 999	701	551	701	215 511 112	423 135	215 934 247
12	Conifer raw trunks	284 618	2 296	286 914	1 437	1 679	1 439	409 074 413	3 854 977	412 929 391
13	Σ Conifer	4 549 383	214 969	4 764 352	1 439	1 113	1 425	6 548 272 632	239 313 149	6 787 585 781

Table 7.4-1 – contd.

No.	Grade	Sale (m³)		Average price (SKK/m³)		Total revenue (SKK)				
		Domestic	Export	Domestic	Foreign	Domestic	Export	Total		
Broad-leaf timber										
14	I class logs	3 106	2 339	5 445	10 044	10 204	10 113	31 196 806	23 867 812	55 064 618
15	II class logs	23 764	10 658	34 422	5 056	5 751	5 271	120 151 895	61 294 774	181 446 669
16	III A, B, C class logs	996 233	101 069	1 097 302	1 763	1 979	1 783	1 756 659 424	200 045 757	1 956 705 181
17	Mining timber	4 803	213	5 016	1 218	1 177	1 217	5 852 409	250 701	6 103 110
18	Thin poles	465	—	465	710	—	710	329 933	—	329 933
19	Pulpwood and ungraded timber	1 473 442	30 869	1 504 311	1 093	1 269	1 097	1 610 647 198	39 188 096	1 649 835 294
20	Chipwood	66 255	17 606	83 861	1 528	1 528	1 528	101 237 640	26 901 968	128 139 608
21	Fuelwood	147 912	7 799	155 711	843	1 267	865	124 756 749	9 881 333	134 638 082
22	Σ 14 – 21	2 715 980	170 553	2 886 533	1 381	2 119	1 425	3 750 832 054	361 430 441	4 112 262 495
23	Broad-leaf stumpage	109 747	—	109 747	325	—	325	35 639 037	—	35 639 037
24	Broad-leaf raw trunks	33 374	—	33 374	1 325	—	1 325	44 232 245	—	44 232 245
25	Σ Broad-leaf	2 859 101	170 553	3 029 654	1 340	2 119	1 384	3 830 703 336	361 430 441	4 192 133 777
26	Σ Conifer + broad-leaf	7 408 484	385 522	7 794 006	1 401	1 558	1 409	10 378 975 968	600 743 590	10 979 719 558

Source: State statistical survey Les (MA SR) 2-04

In 2006, the average timber realization rose by 14 percent when compared to 2005. This rise was associated with the increased demand for conifer grades, which rose by 18 percent. The difference between average prices achieved in the state and non-state sector was 5 percent in favour of the state sector (Table 7.4–2).

Table 7.4 – 2 Average timber prices 2005/2006 (SKK/m³)

No.	Grade	Domestic			Export			Domestic + Export		
		2005	2006	2006/ 2005	2005	2006	2006/ 2005	2005	2006	2006/ 2005
Conifer timber										
1	I class logs	4 110	3 771	0.92	3 727	3 675	0.99	4 009	3 754	0.94
2	II class logs	3 132	3 135	1.00	3 438	3 191	0.93	3 149	3 139	1.00
3	III A, B, C class logs	1 626	1 741	1.07	1 595	1 607	1.01	1 624	1 739	1.07
4	Poles	1 351	2 040	1.51	1 242	—	—	1 277	2 040	1.60
5	Mining timber	1 502	1 301	0.87	1 268	1 187	0.94	1 459	1 283	0.88
6	Thin poles	716	789	1.10	1 032	1 012	0.98	780	802	1.03
7	Pulpwood	774	875	1.13	802	899	1.12	778	878	1.13
8	Chipwood	371	1 223	3.30	—	1 223	—	371	1 223	3.30
9	Fuelwood	396	444	1.12	394	388	0.99	396	444	1.12
10	Σ 1 – 9	1 334	1 497	1.12	1 221	1 109	0.91	1 323	1 477	1.12
11	Conifer stumpage	654	701	1.07	613	551	0.90	650	701	1.08
12	Conifer raw trunks	1 001	1 437	1.44	792	1 679	2.12	973	1 439	1.48
13	Σ Conifer	1 211	1 439	1.19	1 082	1 113	1.03	1 198	1 425	1.19
Broad-leaf timber										
14	I class logs	9 898	10 044	1.01	9 482	10 204	1.08	9 768	10 113	1.04
15	II class logs	4 933	5 056	1.03	4 645	5 751	1.24	4 856	5 271	1.09
16	III A, B, C class logs	1 744	1 763	1.01	2 109	1 979	0.94	1 772	1 783	1.01
17	Mining timber	1 088	1 218	1.12	1 230	1 177	0.96	1 093	1 217	1.11
18	Thin poles	643	710	1.10	—	—	—	643	710	1.10
19	Pulpwood and ungraded timber	999	1 093	1.09	1 147	1 269	1.11	1 005	1 097	1.09
20	Chipwood	1 013	1 528	1.51	1 318	1 528	1.16	1 030	1 528	1.48
21	Fuelwood	721	843	1.17	880	1 267	1.44	722	865	1.20
22	Σ 14 – 21	1 270	1 381	1.09	1 887	2 119	1.12	1 304	1 425	1.09
23	Broad-leaf stumpage	317	325	1.03	—	—	—	317	325	1.03
24	Broad-leaf raw trunks	866	1 325	1.53	—	—	—	866	1 325	1.53
25	Σ Broad-leaf	1 239	1 340	1.08	1 887	2 119	1.12	1 273	1 384	1.09
26	Σ Conifer + broad-leaf	1 220	1 401	1.15	1 249	1 558	1.25	1 223	1 409	1.15

Source: State statistical report *Les* (MA SR) 2-04

Timber prices in Slovakia are still yet to match timber prices in the neighbouring Germany, Austria and the Czech Republic. They are on average an estimated 10 percent lower than



Figure 24 Timber is the most important renewable resource available on domestic market

in the mentioned countries, yet there are certain log grades, e.g. class II beech and oak veneer logs and broad-leaf pulpwood that fetch higher prices in Slovakia than in the Czech Republic. The index of interannual price growth was comparable for Slovakia, the Czech Republic and Austria (14 percent rise). In Germany, the prices rose faster by an estimated 22 percent.

7.5. Timber price factors

The assessment of trends in prices for particular goods is in the conditions of market economy based on the analysis and assessment of market components and conditions of the environment where particular goods (timber grades) are realized; nevertheless, due account of the impact of neighbouring and global markets is also been considered.

Trends in timber prices are currently assessed using a cost-production analysis; this analysis, however, requires the calculation of the total costs of forest production into the cost of conifer and broad-leaf timber production as well as the separation of forest production costs into fixed and variable costs. Model assessment of timber prices in Slovakia was based on the regression analysis which confirmed correlation between the amount of supplied timber and the timber price change in 1998–2005.

In addition to objective factors of the market mechanism, there is a number of other factors impacting trends in timber realization and corresponding market prices. The factors include:

- changes in domestic market demand for particular log grades closely associated with the overall situation in the wood processing industry;
- volume of timber sale realized by domestic producers;

- developments in the sale volumes and timber prices in neighbouring countries;
- changes in the volume of sold and demanded timber in leading world timber producers and consumers (USA, China, Canada, Russia, EU);
- increased volumes of stumpage sale;
- noncompetitive position of small timber retailers with respect to major timber merchants;
- large volume of calamitous timber available across Europe;
- fluctuating exchange rate of SKK towards USD and EUR;
- elaboration and implementation of governmental policies in areas significantly shaping the situation on timber markets (particularly in the area of climate change mitigation and renewable energy resources).



8. FORESTRY ECONOMICS

8.1. Macro-economic conditions

National economy of SR has continued in positive trends for the third successive year since the EU accession. Gross domestic product (GDP) reached 1,636 billion SKK. Its interannual rise indicated in fixed prices reached 8.3 percent, 2.2 percent up on a year earlier. Taken into account the increased rate of inflation (4.5 percent), the GDP rise expressed in fixed prices equalled 13.6 percent. The actual growth of national economy was more than twice the average of the EU-25, and the highest from the group of ten new Member States (EU-10). From the production point of view, GDP growth was associated with considerable growth in the gross added value (GAV) in production and a number of non-production industries. Foreign demand grew by 11.7 percent on a year earlier and reached 22.6 percent; in the same term, domestic demand emulating the set growth rate of 4.1 percent rose to 11.4 percent. Deficit in foreign trade balance started in 2004 further continued to reach 91.6 billion SKK, which compared to previous year represented a staggering 20.5 percent increase. On the other hand, deficit in the state budget slightly improved (6.5 percent) to reach 31.7 billion SKK or 1.9 percent of GDP (Table 8.1–1).

Table 8.1–1 Basic macro-economic indicators in national economy and forest sector

Indicator	Unit	Year				Estimate for 2007
		2003	2004	2005	2006	
GDP in current prices	billion SKK	1 196	1 325	1 471	1636	1 795
– of which forest sector		5.6	7.1	8.4	8.5	8.0
GDP rise in pegged prices of 1995	%	4.2	5.5	6.1	8.3	8.0
Investments in current prices	million	350 050	349 000	376 736	432 084	430 000
– of which forest sector	SKK	582	514	932	1 174	800
Employees	thousand of	2 164	2 170	2 216	2 301	2 250
– of which forest sector	persons	18	15**	13**	12**	13**
Average monthly salary	SKK	14 365	15 825	17 274	18 761	20 200
– of which forest sector	SKK	12 712	14 309	15 543	17 232	19 000
Inflation rate	%	8.5	7.5	2.7	4.5	4.3
Unemployment rate		17.4	18.1	16.2	13.3	15.5
Foreign trade balance	billion SKK	-23.6	-47.0	-76.0	-91.6	-70.0
State budget balance		-55.9	-70.3	-33.89	-31.7	-30.0
Discount rate	%	6.25	6.0	3.2	3.7	3.5
Interest rate		5.05/5.99	4.9/5.5	1.62/6.56	2.12/6.2	1.7/6.0
Exchange rate (central)	SKK/USD	36.8	34.0	31.0	29.7	25.5
Exchange rate (central)	SKK/EUR	41.5	39.9	38.6	37.2	34.5
Growth in average nominal salary	%	6.3	10.2	9.2	8.6	9.0
Growth in average actual salary		-2.0	2.5	6.5	4.1	4.7

Source: NFC-FRI Zvolen and Statistical Office SR (SO SR)

Legend: *Ø Deposit interest rate / Ø credit interest rate; ** employees in forest managing subjects; an estimated 12 thousand of additional employees in 2005 and further 13 thousand in 2006 were employed by business enterprises offering services to forest owners and tenurers

The generation of gross capital grew for a second consecutive year, with the second year growth rate topping the rate from 2005; the interannual rise of 14.5 percent (432 billion SKK) compared well with the 7.9 percent rise a year earlier. The growth was chiefly attributed to increased foreign investments into car manufacturing and associated industries and partially also to motorway construction industry.

Contribution of forest sector to national economy growth in 2006 slightly dropped, the fall being partially mitigated by the sale of the remaining volume of calamitous timber. For the 13.6 percent GDP growth expressed in current prices, the sectoral contribution dropped by 0.07 percent to reach 0.52 percent. Further improvement and stabilisation of the indicator can only be achieved through public recognition of the value of public beneficial forest functions and services delivered by forest industry to other industries of national economy and public and its inclusion into the GAV and GDP values. The realization of domestic timber production in the industries of wood processing sector came in 2006 to an estimated 21.5 billion SKK, i.e. 1.3 percent of GDP. Joint contribution to national GDP of forest and wood processing sectors, including the value of public forest benefits, came to 2.92 percent in 2006.

Economic development in Slovakia has been since 2004 positively influenced by the introduction of a single tax tariff. The tariff has significantly improved taxpayers discipline and tax collection figures, particularly with respect to legal entities. Prices for the majority of goods impacted by EU accession three years ago have stabilised, despite a negative trend in the inflation rate, which increased to 4.5 percent.

After 4 years of failing prices caused by large-scale calamities in forests of northern Europe and a slump in prices on European timber markets, the trend finally reversed. The average figures for timber realization interannually improved by 14 percent. In the same term, average prices of conifer grades increased by 18 percent while the prices of broad-leaf grades at the same time grew only moderately by 6 percent.

8.2. Position of forestry in national economy

In 2006, sectoral GDP remained to be influenced by the sale of last remnants of salvage timber from the calamitous windthrow in November 2004. The total sum received was estimated at 2 billion SKK. The total volume of sold timber was higher than expected by almost 1.4 million m³. The sum represented a 25 percent rise in the volume of realised felling when compared to model values for the last decade. The value of sectoral GDP expressed in current prices rose by 1.19 percent when compared to 2005. This rise was associated with the mitigation of sectoral GDP contribution that dropped by marginal 0.07 percent to 0.52 percent. For the near future, projections suggest return to timber sale volumes experienced before 2004.

The positive trend in investments into forest property and forest production, started in 2005, continued. Investments interannually rose by 25.9 percent to reach 0.27 percent of total investments in national economy, compared to 0.25 percent in 2005.

Sectoral statistics on 2006 employment show an interannual decrease by 0.07 percent compared to national economy as a whole. At the same time, the total number of employees in different areas of forest sector fell down by an estimated 1,000 workforce

to current 12 thousand. The decrease was chiefly attributed to transfer of workforce from the state to private service sector. Failing employment figures appeared more dramatic partly also because of improved figures in the whole sector of national economy. The actual employment rate (forest sector workforce) if referred to output volumes realized in harvesting and other forestry operations in 2006 fell. It is assumed that last year the private sector employed in various occupations an estimated 13 thousand employees.

The long-term negative trend observed in disparity between labour costs and average monthly earnings, when compared national economy and forest sector, recorded a slight improvement last year. The average monthly earnings in forest sector were down by 1, 529 SKK in 2006 (1, 731 SKK down a year earlier) when compared to average earnings reported for the whole sector of national economy. The difference interannually decreased by 11.7 percent.

Table 8.2–1 Recent trends in selected economic indicators

Indicator	Unit	Year							
		1990		2004		2005		2006	
			%		%		%		%
GDP in common prices	billion	278.5	100	1 325	100	1 440	100	1 636	100
Forest sector only	SKK	2.7	0.97	7.1	0.54	8.4	0.59	8.5	0.52
Investments	million	69 741	100	349 000	100	376 736	100	432 084	100
Forest sector only	SKK	553	0.79	514	0.15	932	0.25	1 174	0.27
Workforce	thousand	2 459	100	2 170	100	2 216	100	2 301	100
Forest sector only	of employees	36	1.47	15	0.69	13	0.59	12	0.52
Average monthly earnings	SKK	3 278	100	15 825	100	17 274	100	18 761	100
Forest sector only		3 419	104.3	14 309	90.42	15 543	89.98	17 232	91.85

Source: NFC-FRI Zvolen



Figure 25 Current methods of forest establishment favour natural regeneration

Table 8.2–2 Recent trends in selected economic indicators referring to state budget

Indicator		Actual figures (million SKK)				Projection for 2007
		1990	2004	2005	2006	
Earnings and revenue		4 531	11 484	13 779	14 139	12 250
Costs		4 326	10 632	13 061	12 664	11 406
Economic result (profit +, loss -)		205	852	718	1 475	844
State subsidies for forestry operations		1 007	21	25	122	110
Earnings and revenue rate (%)	Profit	4.52	7.42	5.2	10.42	6.89
	State subsidies	22.22	0.18	0.18	0.86	0.89

Source: NFC-FRI Zvolen, MA SR

The sectoral tax contribution to the state budget amounted to 1, 679 million SKK in 2006. In addition, social and other payments contributed to various funds by legal entities and natural persons generated a further one billion SKK. Current liabilities include unresolved financial obligations related to claims for compensations for forest owners and tenurers resulting from regulatory measures and state administration decisions. The value of liabilities is model put at around 1.3 billion SKK per year. In addition, an estimated 500 million SKK is the cost of air pollution and other anthropogenic damage to forests.

In 2006, majority of the total earnings and revenue in the forest sector (77.6 percent) came from the timber sale. The volume of harvested timber interannually decreased by 18 percent; at the same time, the volume of sold timber decreased by 15.2 percent. Despite a rather sharp fall in the performance figures, the total timber sale revenue was down only by 3.3 percent on previous year because of improved timber realization (14 percent up). When added to other earnings and revenue, it yielded profit of 1,474 million SKK. The sum also included 122 million of state subsidies for forestry operations performed in public interest.

8.3. Earnings and revenue in forest sector

Sectoral earnings and revenue interannually increased only marginally by 2.7 percent. Earnings and revenue in state organizations were down by 5.1 percent. Non-state subjects, on the other hand, recorded the 21 percent increase when compared to 2005 figures. The difference in the achieved economic result was primarily caused by a larger volume of timber sold by non-state subjects (up by 6.1 % on 2005 figures).

Table 8.3–1 Sectoral earnings and revenue in common prices (million SKK)

Forest tenure	1990	1995	2000	2005	2006
State forests	4 531	5 118	6 504	9 708	9 212
Non-state forests	—	2 376	3 178	4 071	4 927
Total	4 531	7 494	9 682	13 779	14 139

Source: PFI 2007, Green Reports, special questionnaire from forest owners and tenurers, state statistical reports Les (MA SR) 5-01, Les (MA SR) 7-01, Les (MA SR) 1-04, Les (MA SR) 2-04, Les (MA SR) 6-01, Uč POD 1-01, Uč POD 2-01

8.3.1. Timber sale returns

The volume of timber sold in 2006 was down by 1,493 thousand m³ (16.1 percent) on the 2005 figures, all this despite the additional volume of sawn timber converted to round timber. The volume of sold timber represented 93.3 percent of the realized felling volume. The remaining volume of felled timber was used for own production consumption or was left in stock on particular sites. The total timber earnings went downward by 3.3 percent (14.8 percent down in state forests, but 20.3 percent up in non-state forests).

A rather significant decline in the total earnings was caused by a lower volume of sold timber. Unfavourable economic results were partly offset by 14 percent increase in the average realization of timber.

Table 8.3–1 Sectoral timber earnings in common prices (million SKK)

Forest tenure	1990	1995	2000	2005	2006
State forests	2 604	3 540	4 621	7 635	6 502
Non-state forests	—	2 074	2 483	3 720	4 478
Total	2 604	5 614	7 104	11 355	10 980

Source: PFI 2007, Green Reports, questionnaire from forest owners and tenurers, state statistical reports Les (MA SR) 5-01, Les (MA SR) 7-01, Les (MA SR) 1-04, Les (MA SR) 2-04, Les (MA SR) 6-01, Uč POD 1-01, Uč POD 2-01



Figure 26 Calamitous events limit delivery of high quality grades and subsequent income

8.3.2. Other earnings and revenue

Other earnings and revenue interannually increased by 26.6 percent. The growth was significantly higher in state forests (up by 31.0 percent; see Annex 14.1. – Tables 1, 3,

9). This source of earnings traditionally includes the sale of non-wood forest products including planting material, forest tree seeds, venison, etc. In addition, further earnings were generated from: sideline production; round timber appreciation in a form of sawn timber sold on markets; hunting, tourism and forestry services; engineering; other production. This category also includes revenue from lease and sale of forest property and revenue from financial capital and securities. Partial overview of other earnings and revenue realized in state forests in 2006 is given in Table 8.3.3–1.

Table 8.3.3–1 Non-wood forest products and sideline production in state organizations 2006

Indicator			Units	Production	Earnings (thousand SKK)
Non-wood forest products	Christmas trees		pcs	7 811	1 650
	Conifer foliage		thousand kg	12	463
Sideline production of goods and services	Sawn timber in sideline wood production	Conifer	m³	11 116	42 080
		Broad-leaf		14 294	117 054
	Tourism services (e.g. chalet recreation, agro-tourism)		—	—	20 440
	Engineering production (machinery, equipment)		pcs	19	38 253
	Engineering services (repair, maintenance)		—	—	86 298
Total			—	—	306 238

Source: State statistical reports *Les (MA SR) 2-04*, *SL MA SR (special survey conducted in the state organizations of forest sector)*

8.4. Public funding

Public funding is used to support both state and non-state organizations of the sector. The bodies supported include also organizations of state administration on forests and other institutions. The figures for 2006 put the volume of public funding (SR) and structural funding (EU) into forestry at 590.4 million SKK, of which 345.9 million SKK was directly allocated to the sector.

Table 8.4–1 Public funding for forestry (million SKK)

Source	Current expenditure	Capital outlay (investments)	Total
Forest sector			
Budget category of MA SR			
08V 01 – Structural Funding for Forest Sector (SOP and RDP)	108.9	75.4	184.3
08V 02 – Revival and Development of Forest Sector	109.6	0.0	109.6
Other sources	43.0	9.0	52.0
Σ Forest sector	261.5	84.4	345.9
Other (MA SR – ŠR)			
NFC Zvolen	127.6	0.0	127.6
SL MA SR and KLÚ	116.9	—	116.9
Σ Other	244.5	0.0	244.5
Σ Forestry	506.0	84.4	590.4

Source: *SL MA SR, APA MA SR*

In 2006, MA SR from its own budget category provided funding under the programmes 08V – *Sustainable Forestry* (sub-programme 08V01 – *Structural Funding for Forest Sector*, sub-programme 08V02 – *Revival and Development of Forest Sector*, and sub-programme 08V03 – *Research and Expert Assistance for Sustainable Forestry*) and 090 – *Policy Formulation, Regulation and Implementation*.

Under the sub-programme 08V01 – *Structural Funding for Forest Sector* funding totalling 184.3 million SKK was granted for projects under SOP and RDP (139 million SKK from structural funds and 45.3 million SKK from the state budget).

The sub-programme 08V02 – *Revival and Development of Forest Sector* primarily funded the following activities: large-scale forest protection; maintenance of national parks; further development of forest management & planning; FMP design; monitoring of forests at risk from forest fires; specialised state administration on forests. The total sum of money allocated to these activities represented 277.5 million SKK (forest sector 109.6 million SKK, state administration 116.9 million SKK, NFC 51 million SKK).

The sub-programme 08V03 – *Research and Expert Assistance for Sustainable Forestry* provided financial support for research on sustainable forestry and expert assistance for forest sector in the total amount of 64.2 million SKK.

Under the programme 090 – *Policy Formulation, Regulation and Implementation*, 4.1 million SKK was allocated to the measure “Education.”

Table 8.4 – 2 Public funding (million SKK)

Use	State sector	Non-state sector	Total
Forestry operations	13,0	108,9	121,9
Investments	9,0	75,4	84,4
Other activities	102,8	36,8	139,6
Total	124,8	221,1	345,9

Source: SL MA SR, APA MA SR

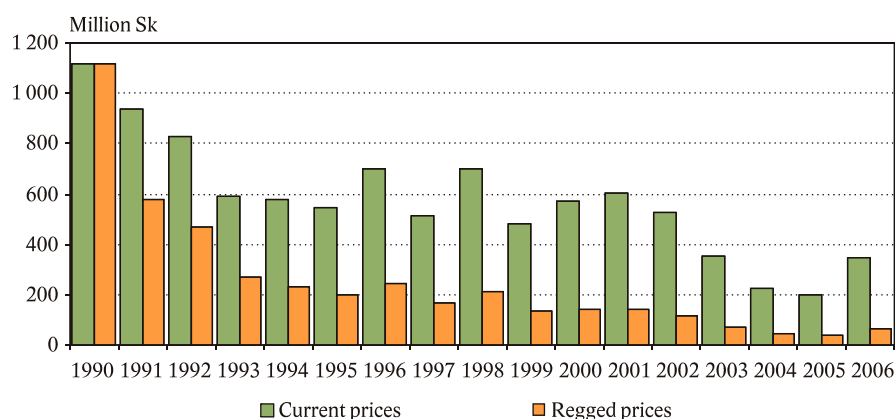


Figure 8.4-1 State funding for services in public interest (million SKK)

From the 2004 onwards, a considerable amount of financial resources allocated to forest sector has come from the EU structural funds. In the 2004–2006 programming period, the EU funding for forest sector was administered through two main programmes: SOP Agriculture and Rural Development (SOP ARD) and the Rural Development Plan (RDP); the latter was compiled in concurrence with SOP ARD. These two programmes administratively belong under the European Agricultural Guidance and Guarantee Fund (EAGGF).

Table 8.4–3 Overview of projects submitted and approved by regional APA offices eligible under SOP A-RD and RDP (cumulative to March 31 2007, thousand SKK)

Programme	Regional office	Accepted projects			Approved projects		
		No.	Planned approved costs	Total public expenditure	No.	Public sources	
						Total	From EC
SOPARD (Measure 2.1)	Zvolen	32	262 379	193 680	18	100 900	76 284
	Košice	43	170 529	143 406	25	61 107	46 935
	Nitra	3	5 159	2 711	1	1 433	1 003
	Prešov	71	329 451	302 891	41	138 275	108 175
	Trenčín	16	84 146	61 840	12	38 872	28 917
	Trnava	0	0	0	0	0	0
	Žilina	71	342 627	242 291	36	116 793	86 064
	Total	236	1 194 291	946 820	133	457 380	347 378
RDP (Measure 7 + 8)	Bratislava	4	1 093	1 037	2	459	242
	Zvolen	8	23 564	23 564	1	1 695	1 356
	Košice	1	3 390	3 390	0	0	0
	Nitra	0	0	0	0	0	0
	Prešov	1	4 786	4 786	1	4 725	3 780
	Trenčín	4	6 864	6 864	1	3 356	2 685
	Trnava	0	0	0	0	0	0
	Žilina	8	20 153	20 153	4	11 436	9 149
	Total	26	59 850	59 794	9	21 672	17 212
SOPARD + RDP		262	1 254 141	1 006 614	142	479 052	364 590

Source: APA

8.5. Forest sector costs

The total cost of production, commercial and other activities of forestry organizations interannually fell by 3.1 percent, which was pro rate to observed decline in the volume of felling and certain silvicultural operations. In the non-state sector, the cost went up by 6.2 percent while the cost in state sector was 4.1 percent down on previous year figures (Annex 14.1. – Tables 1, 7). Comparison of the volume of felling operations and the volume of silvicultural operations with the total 2005–2006 cost and the actual interannual inflation rate shows a slight increase in the total cost even if for the organizations of non-state forests only (1.7 percent up). More significant growth in the total cost of forest-related operations in non-state sector was partially precluded by unvalued (unrecorded) labour input of forest owners and tenurers self-managing their forest properties.

Table 8.5–1 Forest sector costs in current prices

Indicator	1990	1995	2000	2005	2006
Total production costs	4 326	7 419	9 497	13 061	12 664
Material costs including depreciation	1 976	3 226	3 990	5 139	5 616
Depreciation	596	—	813	834	839
Personnel costs	2 056	2 304	3 891	4 175	3 660
– of which labour costs	1 490	—	2 789	2 985	2 649

Table 8.5–2 Forest sector costs in pegged 1995 prices

Indicator	1990	1995	2000	2005	2006
Total production costs	11 775	7 419	6 400	6 629	6 152
Material costs including depreciation	5 379	3 226	2 689	2 608	2 728
Depreciation	1 622	—	548	423	408
Personnel cost	5 596	2 304	2 622	2 119	1 777
– of which labour costs	4 056	—	1 880	1 515	1 286

Source: PFI 2007, Green Reports, questionnaire from forest owners and tenurers, state statistical reports Les V (MA SR) 5-01, Les F (MA SR) 7-01, Les V (MA SR) 1-04, Les D (MA SR) 2-04, Les P (MA SR) 6-01, Uč POD 1-01, Uč POD 2-01

*Figure 27 Weeding constitutes an important part of plantation treatment*

8.5.1. Material costs including depreciation

A modest increase (9.3 percent) in the category of material costs, which also includes energy and depreciation, reflected the actual increase in market prices and performed operation volumes, particularly in the category of silvicultural measures.

8.5.2. Personnel costs

The personnel costs in forest sector interannually fell by 12.3 percent. In the state sector, the respective costs decreased by 21.1 percent; the fall was chiefly attributed to the restricted volume of operations and was also partially subdued by a real increase in the salary levels. On the other hand, in the non-state sector the personnel costs increased by 3.4 percent (Annex 14.1. – Tables 1,3, 9); the increase was accompanied by a negligible drop in the workforce numbers. The reduction of workforce topped by a growing volume of operations was recognised as main factors of increased labour productivity and improved average nominal salaries (up by 10.9 percent). At the same time, real monthly salaries grew by 6.4 percent. The income of non-state forest owners, who themselves actively managed their properties and performed particular operations, is included in the Summary Forest Economic Account (SFEA) where it forms a part of net pension from the independent economic activity or net business profit.

8.5.3. Production costs analysis

Particular sections of Chapter 8 and Tables 1–10 of Annex 14.1. comprise information on and the evaluation of extensive indicators and their trends. The majority of indicators are given in a form of absolute volumetric and economic values, relative rates, trends and increments of natural and economic indicators in state and non-state forests.

Objective assessment of management results requires a qualified evaluation of key production factors quality and financial analysis of economic activity based on analytical accounting figures. With respect to that, it is necessary to establish a fully functional network of reporting structures for acquisition of analytical figures from the non-state subjects. Framework assessment of the standard of management performance of state and non-state subjects was conducted on the basis of natural production factor quality assessment (Table 8.5.3–1) and intensive indicators of their production (Table 8.5.3–2).

Table 8.5.3–1 Natural production factors in state and non-state forests 2006

Indicator	Unit	State organizations	Non-state subjects	Total
Functional forest category				
– commercial (C)	thousand	716/67	580/69	1 296/67
– protection (P)	ha / %	179/16	149/17	328/17
– special purpose (SP)		182/17	115/14	297/16
Species composition in C forests				
– conifer	%	31,7	40,8	35,8
– broad-leaf		68,2	59,2	64,2
Average yield class in C forests				
– conifer	m	30,4	29,5	29,9
– broad-leaf		25,5	25,0	25,2
Growing stock in C forests per ha				
– conifer	m ³	284	284	284
– broad-leaf		204	206	205
Total		229	238	233

Source: NFC-FRI Zvolen, PFI 2007, Record L-144, State statistical survey MA SR Les (MA SR) 7-01, Les (MA SR) 1-06, Les (MA SR) 2-04, Les (MA SR) 5-01, Les (MA SR) 1-04, Uč Pod 1-01, Uč Pod 2-01

The 2006 values of particular indicators of natural production factors indicate the absence of more significant differences in the state of forest ecosystems managed by various ownership groups (state, non-state). The percentage of functional forest categories, average yields and growing stock per hectare given for two main tree species groups was well comparable with the percentage for 2005. Similarly, other factors, such as age structure, stand density, forest damage and terrain, were also of a comparable value. Non-state forests have a partial comparative advantage of a larger percentage of conifer species in commercial forests.

Table 8.5.3–2 Average total costs of selected silvicultural and felling operations (SKK)

Operation	Unit	State organizations		Non-state subjects		Total	
		2005	2006	2005	2006	2005	2006
Total regeneration	SKK/ha	35 130	42 906	27 946	32 129	33 207	38 153
Artificial regeneration		51 440	51 563	38 650	37 804	46 209	45 495
Natural regeneration		6 202	5 520	5 850	4 388	6 070	5 020
Forest plantations tending		5 814	8 157	3 890	4 767	5 245	6 662
Protection of young forest stands		4 124	4 055	4 300	4 406	4 202	4 210
Cleaning		4 993	4 913	4 240	4 261	4 747	4 625
Forest protection	SKK/ha of forest	100	136	5	41	85	94
	SKK/ha of ofrest	941	915	753	698	863	819
Silviculture	SKK/ha of regen. area	136 230	109 194	116 300	103 640	128 329	106 745
	SKK/ha of felling	212	216	190	171	197	196
Felling	SKK/m ³	106	128	140	146	136	136
Skidding		213	265	190	175	189	225
Log scaling		187	122	116	49	169	90
Timber hauling		200	145	90	102	158	126
Construction and repair of unpaved forest roads and maintenance of forest roads and depots	SKK/m ³ of felling	116	113	29	62	101	91
Felling	SKK/m ³	965	1 157	786	474	893	856
	SKK/ha of forest	1 286	3 042	3 482	1 930	2 510	2 552
Silviculture+ felling	SKK/m ³ of felling	1 177	1 373	976	645	1 090	1 052
	SKK/ha of forest	2 227	3 957	4 235	2 628	3 373	3 371

Source: NFC-FRI Zvolen, *Compendium of Slovak Forestry Statistics (SFMP, PFI) 2007, Record L-144, Sectoral statistical records of MA SR Les F (MA SR) 7-01, Les P (MA SR) 1-06, Les D (MA SR) 2-04, Les V (MA SR) 5-01, Les V (MA SR) 1-04 Uč Pod 1-01, Uč Pod 2-01, Analytical standards of state forest enterprises, Green Reports*

Indicators of intensity costs for the non-state sector were generated from the data of selective reporting units (Table 8.5.3–2). The data were compiled from Les V (MA SR) 5-01 – yearly record on performance and management in non-state forests, and the Record L-144. The values of unit cost indicators were determined as a rate between exact operation costs and its volume from the selected set. The total volume for a particular operation was calculated as a product of the unit cost of a selected group and the total volume (including the measuring unit) extracted from the Record L-144. In the absence of unit costs, these

were taken from the category of municipal, non-state or state forests.

The total unitary costs of silvicultural operations in state organizations rose only marginally, that is with the exception of natural regeneration, young forest protection, and cleaning & silvicultural operations per hectare of forest and ha of regenerated area. In the non-state sector, the unit costs rose for operations shown in Table 8.5.3–2 except for natural regeneration & silvicultural operations per hectare of forest, and the regenerated area and m³ of felled timber. Summary figures for entire sector show a fall in total unitary cost for artificial and natural regeneration and cleaning, but increase for the remaining set of operations.

The total unitary costs of felling operations in the state sector rose for all listed operations and indicators except for log scaling, timber hauling and costs related to construction and repair of unpaved forest roads; the costs of main forest roads and depots maintenance were also included. In the non-state sector, unitary costs per m³ of felled timber fell for all listed operations except for felling, timber hauling and costs related to construction and repair of unpaved forest roads; likewise included were the costs of forest roads and depots maintenance (Table 8.5.3–2).

The trend of further approximation of unitary costs observed in previous years for the majority of silvicultural and felling operations continued. Variability of interannual costs can to a great degree be contributed to differing natural/production conditions, in which forest production is realized in a particular year, and conditions on local labour markets.

8.6. Intensity of production factors exploitation and economic result

8.6.1. Value of production factors

The value of natural production factor (forest properties and forest stands) differs from one year to another depending on the area changes within state and non-state forests. The total initial value of forests given in Regulation No 492/2004 Coll of MJ SR on the general value of forest property was down by 0.5 percent when compared to 2005. More detailed figures are given in Table 8.6.1–1.

Table 8.6.1–1 Value of natural production factor, stock and labour

Production factor and stock	Sector (million SKK)		Total (million SKK)	Average (thousand SKK per ha of forest)
	State	Non-state		
Forest property	47 278	37 174	84 452	42.10
Forest stands	110 615	86 975	197 590	98.50
Total	157 893	124 149	282 042	140.60
MIA in residuary value	8 984	875	9 859	4.91
– of which buildings and constructions	7 655	384	8 039	4.01
– Machinery and equipment	1 329	491	1 820	0.91
Labour costs (personnel costs)	2 280	1 380	3 660	1.82

Source: Compendium of Slovak Forestry Statistics (SFMP), PFI 2007, Summary Úč POD 2-01, Les (MA SR) 5-01, FRI Zvolen (special questionnaire from forest owners and tenurers)

Note: MIA – material investment assets.

8.6.2. Intensity of production factors exploitation

Interannual comparison of the intensity of exploitation of major production factors given in Table 8.6.2–1 shows a rise in the category of natural resource and stock, that is with the exception of labour factor (earnings and revenue, material costs including depreciations, wages) connected with a noticeable increase in labour productivity. The interannual drop in the volume of subsidies per hectare observed by 2004 was in 2006 replaced by an interannual growth of a staggering 388 percent.

Table 8.6.2–1 Intensity of production factors exploitation in the nominal value of current year (SKK/ha)

Indicator	2004	2005	2006	Growth index 2006/2005
Earnings and revenue	5 724	6 869	7 054	1.027
of which subsidies for forestry operations	10,47	12,46	60,82	4.881
Production costs	5 300	6 511	6 313	0.969
Material costs including depreciation	2 423	2 562	2 800	1.093
Depreciation	409	416	418	1.005
Labour costs	1 316	1 488	1 321	0.887

Source: Sectoral statistical record Les F (MA SR) 7-01, Summary Úč POD 2-01, Analytical standards of state forest enterprises, NFC-FRI Zvolen (special questionnaire from forest owners and tenurers), Les (MA SR) 5-01

8.6.3. Economic results

The overview of key sectoral economic and financial indicators for 1990, 2003–2006, outlook for 2007, and projections for 2008, divided into state forests under the auspices of MA SR, state forests managed by other sectors, non-state forests, is given in Annex 14.1.–Tables 1–10. Together with Figures 8.6.3–1 – 8.6.3–2, the Tables conclude the following:

- Within the European framework, the forest sector has become competitive in terms of market products, public-beneficial forest functions and related know how. Nevertheless, the improvement in the area of enforcement of principles of ecological-economic sustainability and enhancement of sectoral effectiveness are both much needed.
- The volumes of silvicultural operations from 1990 onwards mirror an increased level of exploitation of natural conditions and their financial severity. For the future, it is important to secure resources for conservation and enhancement of forests based on their socio-economic benefits.
- Natural regeneration has for a number of years been seen as a preferred method of forest establishment because of its multiple positive effects on economics of silvicultural operations, forest protection, biodiversity conservation, the environment, and the total revenue of internalities and externalities of forest ecosystems.

The comparison of economic results of state organizations given in current prices showed a gradual decrease in 1990 and 2004; in the latter year, however, a previously negative trend reversed. Quality and effectiveness of management of state forests was most influenced by results achieved by the State Forests of SR, s.e.

Accordingly, economic results achieved in the sector of non-state forests showed a steady improvement. Since 2003, the overall economic result achieved in the sector has been evaluated taking into account the previously unconsidered value of labour input of forest owners, tenurers and their respective family members.

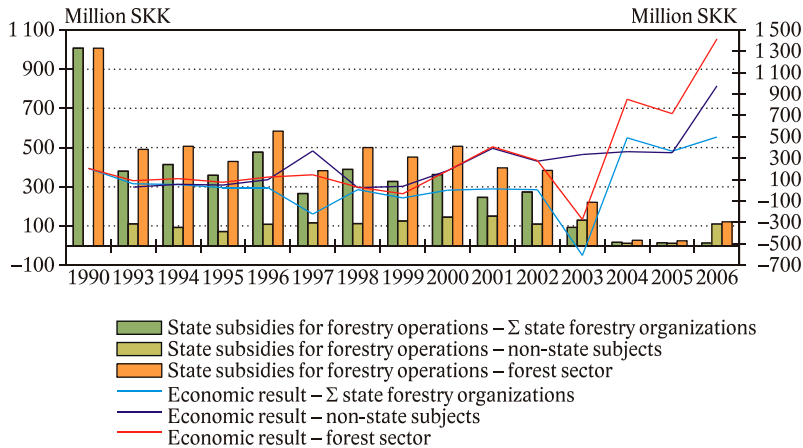


Figure 8.6.3–1 Comparison of trends in state subsidies for forestry operations and economic result in state organizations, non-state subjects and forest sector (1990–2006)

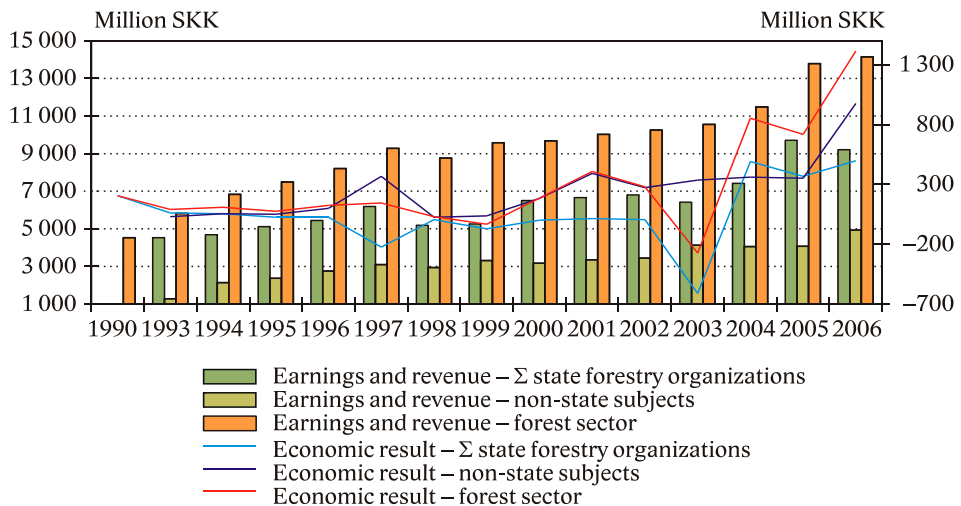


Figure 8.6.3–2 Comparison of trends in earnings, revenue and economic results in state organizations, non-state subjects and the sector 1990–2006

Trends in state subsidies (given in nominal values excluding inflation) pumped into the state sector have shown a continual decline, with the strictest restrictions applied in 2004–2006. State subsidies granted for the non-state sector have, on the other hand, been steadily growing with the exception of few variation years. In real terms, state subsidies provided for the sector in 2000–2006 were several times lower once the inflation from 1990 onwards was accounted for.

Earnings and revenue were in 2006 positively impacted by larger volumes of realized log grades resulting from the improved situation on European markets with timber and the weakening impact of asymmetry on the domestic market caused by surplus of calamitous timber available from salvage felling. At the same time, the decrease in a disproportionately large volume of outstanding overdue debts from 2005 was recorded. The debt increase was primarily caused by lax payment discipline of newly emerging timber merchants. In

the category of labour productivity, in which figures are derived from earnings and revenue clean of state subsidies, a mild growth per employee observed in recent years continued.



Figure 28 Quantification of the value of multiple goods and services provided to the society by forests is crucial for forestry economics

8.6.4. Economic results

Forest management can appositely be assessed on the basis of economic results achieved in forest production and total production. Economic results of forest production are given in a form of income-cost rate in which the income part includes the revenue generated from timber sale, other forest production and forestry services while and the costs part consists of silvicultural, felling and other forest production costs. More detailed overview of economic results achieved by forestry subjects is given in Table 8.6.4–1.

Table 8.6.4–1 Economic results (SKK)

Forest tenurers	Unit	Forest production			Total production		
		2004	2005	2006	2004	2005	2006
State organizations	SKK/ha of forest	1 053	1 489	644	412	313	443
	SKK/m ³ of felling volume	291	268	152	114	56	104
Non-state subjects	SKK/ha of forest	689	668	1 095	443	422	1 105
	SKK/m ³ of felling volume	190	151	269	122	95	272
Average for all forests	SKK/ha of forest	905	1147	843	425	358	735
	SKK/m ³ of felling volume	250	226	204	117	70	178

Source: NFC-FRI Zvolen, State statistical records Les (MA SR) 7-0 1 and Les (MA SR) 4-01

8.7. Economic tools

8.7.1. Prices of key production factors

The official evaluation of a particular forest property which includes its natural production factor and products of production process is currently based on the method of regulated and market prices. The method of regulated price is applied in compliance with Regulation of MJ SR No 492/2004 Coll on the estimate of general value of forest property and Act No 326/2005 Coll on forests specifying the value of non-production forest functions. The regulated value (official market value) of a particular property and its contribution to public-beneficial benefits of forests is primarily applied with respect to state and state bodies (taxes, fees). At the same time, it is also taken as the informative level of market price which duly accepts formal factors of the offer and demand.

8.7.2. Taxes

The property tax interannually increased by 11.7 percent. The main increase of 17.3 percent was observed in the category of state forests. This tax is linked to the annual tax exemption and entry of those groups of commercial forests in which regeneration or incidental felling were previously realized. It also relates to non-stocked forest land pending reforestation and forest stands in the age of first thinning. It includes tax paid from constructions and development land. The tax formed 8.5 percent of the total volume of claimed taxes.

From the total amount of taxes annually paid to state and municipal budgets, the state forestry organizations contributed in 2006 by 64.9 percent. The non-state subjects' share was the remaining 35.1 percent.

Table 8.7.2–1 Trends in particular taxes contributed to state and municipal budgets (million SKK)

Tax	Year	Forest tenurers		Total
		State organization of the sector	Non-state subjects	
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
	2006	637	360	997
Property tax	1998	80	30	110
	2000	73	26	99
	2003	74	27	101
	2004	76	28	104
	2005	98	30	128
	2006	115	28	143
Road tax	1998	25	10	35
	2000	32	8	40
	2003	29	7	36
	2004	47	7	54
	2005	28	8	36
	2006	28	8	36

Table 8.7.2–1 – contd.

Tax	Year	Forest tenurers		Total
		State organization of the sector	Non-state subjects	
Income tax ^{*)}	1998	133	45	178
	2000	149	38	187
	2003 ^{**)}	258	174	432
	2004	329	166	495
	2005	257	171	428
	2006	310	193	503
Total	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
	2006	1 090	589	1 679

Source: NFC-FRI Zvolen (Special questionnaire from forest owners and tenurers)

Note: ^{*)}qualified estimate; ^{**) derived from the paid salaries and gross profit.}

The property tax interannually increased by 11.7 percent. The main increase of 17.3 percent was observed in the category of state forests. This tax is linked to the annual tax exemption and entry of those groups of commercial forests in which regeneration or incidental felling were previously realized. It also relates to non-stocked forest land pending reforestation and forest stands in the age of first thinning. It includes tax paid from constructions and development land. The tax formed 8.5 percent of the total volume of claimed taxes.

From the total amount of taxes annually paid to state and municipal budgets, the state forestry organizations contributed in 2006 by 64.9 percent. The non-state subjects' share was the remaining 35.1 percent.

8.7.3. Credits

Business enterprises exploit this source of funding very carefully. They primarily use it to cover the following:

- deficits in short-term financial needs;
- overdue payments for timber;
- purchase of crucial items of intermediate consumption.

Non-state subjects more often than state organizations choose credits to finance their activities which also include the purchase of machinery and road construction operations, the latter of which can also be financed from public sources and the EU funds.

Table 8.7.3–1 illustrates a further moderate decrease in the interest rate of acquired credits compared to 2005, and the increase in the level of secured credits provided by commercial banks. In 2005, the security level reached 1.04 fold of the value of granted credits. In 2006, the same value was 1.22.

Table 8.7.3–1 Trends in credits volume (million SKK)

Credit	Sector						Total		
	State			Non-state ^{a)}					
	2004	2005	2006	2004	2005	2006	2004	2005	2006
Credits from previous years (unpaid)	40	36	35	20	20	25	60	56	60
Bank credits accepted in a particular year	0	56	60	60	60	50	60	116	110
Total	40	92	95	80	80	75	120	172	170
Level of proprietary guarantee	28	29	28	150	150	180	178	179	208
Interest rate	7.5	7.0	6.9	7.3	7.0	6.5	7.4	7.0	6.7

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

Note: ^{a)}qualified estimate

8.7.4. Levy for forest property exclusion

The purpose of this levy is to protect sustainability of forest ecosystems and their non-production (public-beneficial) benefits. The obligation imposed by § 9 of Forest Act grants compensation payments for the loss of non-production forest functions in the event of forest property being excluded from the fulfilment of forest functions. The official value of non-production functions has been derived for the average rotation period established for a particular FSTMU in thousands of SKK per ha of forest. Rates for particular effects of non-production forest functions are given in Annex 1 of Forest Act.

The amount of levy is established by the decision of a particular body of state administration on forests and hunting (Chapter 11.1.). According to § 9 of the act, only those cases of forest property exclusion which are subject to actual deforestation are under obligation to pay levy.

Implementation of these stipulations increases economic barriers for permanent and temporary confiscation of forest properties for non-biological forms of exploitation.

8.7.5. Fines and sanctions for the violation of enforced regulations

In 2006, the bodies of state administration on forests imposed fines in the total sum of 2 million SKK to approximately 300 different state and non-state subjects. The amount of actually paid fines reached an estimated 600 thousand SKK (30 percent).

8.7.6. Compensations for forest property damage

These compensations are in addition to general regulations also regulated by a number of Forest Act provisions. At present, forests are most damaged by anthropogenic activities, air pollution in particular. The subsidizing effect of air pollution on forests causes an annual damage of approximately 500 million SKK in monetary terms. Expertly rated amount of air pollution damage in state and non-state forests represents an estimated 120 million SKK per year. The process of damage exaction is nevertheless very slow and each year only

an estimated 20 percent of confirmed damage is claimed. One of the solutions to improve the situation is to use a certain percentage of air pollution fees on the implementation of remedial measures in forests.

8.8. Compensations for restriction of ownership rights

The largest volume of restrictions on the execution of ownership rights derives from the following acts: Act No 543/2002 Coll on nature and landscape protection; Act No 326/2005 Coll on forests; Building Act No 50/1976 Coll in the wording of the pursuant regulations; Act No 23/1962 Coll on hunting in the wording of the pursuant regulations; Act No 70/1998 Coll on energy industry.

Computing of more accurate values of compensations would at present request a range of new investigations and quantifications.



Figure 29 Powerlines restrict ownership rights of forest owners for which adequate compensation should be awarded

8.9. Investment trends

8.9.1. Volume of work and supplies provided for commercial development

In 2006, the volume of work and supplies provided for commercial development amounted to 1.174 million SKK. The figure represented the increase of 242 million SKK when compared to 2005. From the total volume of investment, construction investments were 520 million SKK, investments into machinery and equipment were 577 million SKK and other investments were 77 million SKK.

In state organizations, the total volume of investments reached 1, 024 million SKK; the sum represented a 217 million SKK rise compared to 2005. In non-state subjects, comparable investments reached 150 million SKK. This volume represented a 25 million SKK increase when compared to 2005.



Figure 30 Harvester Menzi Muck A71 in a windthrow affected area

Table 8.9.1–1 Investments 2005–2006 (million SKK)

Investment category	Forest sector		Z toho					
			State organizations		State organizations of MA SR		Non-state subjects	
	2005	2006	2005	2006	2005	2006	2005	2006
Construction works	403	520	363	465	243	346	40	55
Machinery&equipment	462	577	387	502	325	453	75	75
Other	67	77	57	57	47	4	10	20
Total	932	1 174	807	1 024	615	803	125	150

Source: Statistical record Les (MA SR) 8-01; NFC-FRI Zvolen

Table 8.9.1–2 Development investments in state organizations of MA SR

Type	million SKK
Forest roads	184
Timber depots	35
Torrent regulation	22
Buildings, objects and construction sites	15
Nursery operations	—
Other development activities	90
Total	346

Source: Statistical record Les (MA SR) 8-01

8.9.2. Investments into machinery and equipment

Investments into machinery and equipment accounted for 577 million SKK in 2006. This figure represented a 115 million SKK increase when compared to 2005. In non-state forests, the investment package amounted to 75 million SKK, which compared to a previous year. The structure of machinery & equipment investments in state forest enterprises under MA SR, total value of which reached 453 million SKK in 2006, is shown in Table 8.9.2–1.

Table 8.9.2–1 Machinery & equipment investments in state organizations of MA SR

Investment category	million SKK
Felling machinery & equipment	—
Skidding machinery & equipment	41
Timber hauling machinery & equipment	15
Log scaling machinery & equipment	91
Wood-chipping machinery & equipment	11
Machinery and equipment for silviculture & forest nurseries	21
Passenger & technological transport	47
IT	108
Software	119
Total	453

Source: Reports on results of economic performance analysis in state forest enterprises under MA SR for 2006



9. FORESTRY INFORMATION SYSTEM AND FORESTRY STATISTICS

9.1. Forestry Information System

Forestry Information System (FIS) in its current structure and content serves the main purpose of performing diverse *communications, information and management* functions.

The system is interconnected with the central data bank that stores information from all existing partial systems (subsystems). There is a number of different partial systems (IS) currently operated in the forest sector, including:

- Forest Condition IS – this system stores and manages data from forest condition investigation, forest management planning, monitoring, assessment and projections of forest development.
- State Forestry Administration IS – this system searches for, processes and evaluates data from different hierarchical levels of state administration including District Offices, Regional Offices and central bodies of state administration on forestry.
- State Forest Sector IS – this system ensures automated processing of data related to production, marketing, personnel costs, material-technical basis, Forest Record, capital assets, commercial development, property registry, accounting, etc.
- Non-state Forest Sector IS – this system supplies crucial information on the management of non-state forests and achieved economic results.
- Forest Research Institute IS – this system focuses on forest-related scientific and technical data and development of the in-house database on forest condition, research plots and forest health monitoring.
- State Nature Conservancy IS (SNC IS) – this system is primarily developed to operate a database offering comprehensive data on plant species, forest game, forest damage, etc.
- Forest Tree Species Gene Pool IS – this system provides comprehensive data on supplied shelled material, acquired forest tree seeds, marketing, provenience, and seed distribution.
- IS of state agencies not operated by MA SR – this system comprises fundamental data on management of their forests and achieved economic results.
- Sectoral Statistics IS – this system provides for collection, processing and evaluation of sectoral statistical data consistent with the provisions of Act No 540/2001 Coll on state statistics in the wording of Act No 215/2004 Coll.
- Forestry Market IS – this system deals with various aspects of monitoring and evaluation of data on supply and prices of timber and planting/seed material on domestic and foreign markets.
- Geographical Information System (GIS) – this system has a cross-sectional character and forms an integral part of other subsystems, e.g. Forest Condition IS.
- Metainformation System – this system serves as a universal source of information for effective use and exploitation of FIS.

FIS is a modern communications tool which provides data not only for different levels of forestry management and decision making but also for other sectors and public. FIS

products are alternatively accessible in a printed, file or network digital form (INTERNET). Main FIS products include:

- data from forest management plans, comprehensive survey of forest condition, forest health monitoring, and national forest inventory;
- Compendium of Slovak Forestry Statistics, Summary Forestry Economic Account;
- Register of Forest Owners and Tenurers;
- prices of main forest commodities provided by market monitoring;
- realization outputs from the Forestry Practice IS – production figures, economic data, etc.
- Thematic State Map Set – forestry theme. and sectoral GIS.

9.2. Information on forest condition

Forest stand description

Description of forest stands, a process which forms an integral part of detailed forest condition investigation for FMP design, provides up-to-date data on a number of condition parameters. The investigation is conducted for each particular unit of spatial forest distribution (compartment, forest crop group, storey, seed trees, etc.) separately. The data, which is gathered in a regular 10-year cycle, primarily serve to establish a fully operational plan of management measures. The "Description" covers only forest stands and other land on forest properties.

The data is collected using different methods of which methods based on yield tables and ocular estimate are preferred. Acquired data is stored in a forest management database and their summary provides basis for the compilation of the Summary Forest Management Plans (SFMP) and fact sheets of the Permanent Inventory (PFI). Summarised stand data are related to different time horizons and as such have different time validity (1–10 years). Their accuracy and reliability is, however, unknown and it is impossible to estimate it retrospectively, the fact preventing not only their objective evaluation, but also their comparison (monitoring).

National Inventory and Forest Monitoring (NIML)

NIML is based on a selective mathematical-statistical method of forest condition investigation and refers to both national and regional level. In addition to forests on forest

properties it also covers forests on other land.

In 2006, 710 terrestrial inventory plots (IPs) out of the total number of 1,486 IPs were established. The remaining plots were set up back in 2005. The acquired primary data



Figure 31 Use of aerial imagery reduced the cost of national forest inventory and monitoring

were used to calculate summary characteristics at the IP level. At the same time, biometric models and algorithms for automated data processing in addition to the set of volumar equations for the calculation of timber volume in three volumar units (timber at the top > 7 cm i. b., volume of trunk in bark, volume of tree in bark) were prepared. In addition, equations on the calculation of the log grade structure at a particular IP were verified. The plan for 2007 suggests that collected data be fully checked, processed and results delivered in an acquired form.

Forest health monitoring

Monitoring of forest health represents a complex monitoring system primarily designed to investigate and compare changes in forest ecosystem health. The system is based on a selected set of evaluated and measured parameters. Permanent monitoring plots (PMPs) have been established in a systematic orderly manner in a 16×16 km grid. In total, 112 of level I PMPs have been established to date. These plots are used for a so-called extensive monitoring in which annual assessment of depigmentation and defoliation (SAO %), based on *ICP-Forests* methodology, is performed during 2–3 weeks of August.

The set of measurements forming basis of intensive monitoring of forest ecosystems, a so-called second level of monitoring, is within Europe taken on 860 PMPs of 30 different countries. The main objective of this this monitoring is to contribute to better understanding of impacts of air pollution and other factors on forest ecosystems. On the territory of Slovakia, these measurements are taken from 7 PMPs.

Up-to-date information on the health of Slovak forests, based on a particular year investigation and national / European trends data available from 1987 onwards, is provided in the annual summary report available on the website of the Centre for the Partial Monitoring System Forests (PMS Forests).

Table 9.1–1 Trends in defoliation of selected tree species and their groups

Tree species	Average defoliation (% ± mean error)						
	2000	2001	2002	2003	2004	2005	2006
Beech	14.9 ± 0.6	20.7 ± 0.8	16.5 ± 0.5	21.9 ± 1.0	18.6 ± 0.6	17.1 ± 0.6	17.5 ± 0.6
Oak	23.3 ± 0.9	24.0 ± 0.7	23.4 ± 1.0	24.2 ± 0.9	26.5 ± 1.1	25.0 ± 1.1	23.4 ± 0.8
Hornbeam	14.2 ± 1.1	22.7 ± 2.6	16.4 ± 1.1	20.4 ± 1.3	19.8 ± 1.8	15.8 ± 1.5	19.7 ± 1.4
Ash	22.9 ± 2.5	24.4 ± 2.3	24.0 ± 1.9	27.3 ± 1.9	26.0 ± 2.5	22.3 ± 2.5	28.1 ± 1.9
Maple	16.5 ± 1.5	20.7 ± 1.9	17.5 ± 1.4	20.9 ± 0.9	22.2 ± 2.0	19.9 ± 1.2	21.2 ± 1.3
Locust	39.8 ± 3.7	37.3 ± 6.7	36.1 ± 5.2	37.8 ± 4.6	28.2 ± 5.0	28.0 ± 7.5	28.8 ± 7.2
Broad-leaf	18.3 ± 0.8	22.3 ± 0.9	19.0 ± 0.8	22.6 ± 0.8	20.9 ± 0.7	19.2 ± 0.6	19.7 ± 0.6
Spruce	28.2 ± 1.2	26.5 ± 1.0	26.5 ± 0.9	25.6 ± 0.8	26.4 ± 0.7	26.4 ± 0.9	27.2 ± 0.9
Fir	28.3 ± 2.9	28.8 ± 1.8	29.3 ± 1.7	29.7 ± 1.2	26.8 ± 1.1	25.1 ± 1.1	29.5 ± 1.7
Pine	22.0 ± 1.3	24.7 ± 1.3	26.4 ± 1.5	27.3 ± 1.1	26.1 ± 1.3	26.6 ± 1.5	27.8 ± 1.5
Larch	20.3 ± 1.5	26.3 ± 2.6	27.4 ± 2.5	27.4 ± 2.4	24.8 ± 1.7	24.6 ± 2.0	22.3 ± 2.0
Conifer	26.5 ± 1.0	26.3 ± 0.8	26.9 ± 0.8	26.5 ± 0.7	26.3 ± 0.5	26.2 ± 0.7	27.4 ± 0.7
Total	21.6 ± 0.8	23.9 ± 0.7	22.2 ± 0.7	24.2 ± 0.6	23.2 ± 0.5	22.3 ± 0.6	23.1 ± 0.6

Source: *NFC-FRI Zvolen*

9.3. Socio-economic data and workforce

Acquisition of socio-economic data

Within the framework of socio-economic investigation, the data on employment, workforce, sickness rate and occupational injuries are primarily requested.

Employment in Slovakia is monitored in line with the provisions of EU regulations (Council Regulation (EC) No 577/98 on the organization of a labour force sample survey in the Community) enforced in the Member States. The methodology fully corresponds with the recommendations of the International Labour Organization (ILO) and allows for classification according to the Sectoral Classification of Economic Activities (SCEA). An absolute number of full-time employees in the state sector organizations is calculated from the data provided by a special survey questionnaire issued by MA SR.

Data on average salaries are acquired for a set of enterprises with 20+ employees (for organizations performing financial mediation and all non-business organizations regardless of the number of their workforce) and for enterprises with < 20 workforce and annual production turnover topping 100 million SKK. The set does not include small enterprises with less than 19 employees and private businessmen not registered in the Commercial Register (including their employees).



Figure 32 Number of forest workers employed by state forestry organizations is continually declining

Labour motivation

Figures for 2006 indicate a fall in the number of workforce employed in the industry of forestry, timber felling and associated services (SCEA 02), when compared to a year earlier (1.7 percent down). Mass switch to outsourcing policy observed in the state sector leads to a permanent decrease in the number of full-time staff, especially in the category of workers. At the same time, a number of new commercial enterprises were set up.



Figure 9.2-1 Forest sector employment

Source: SO SR

Note: "Others" category includes employees of non-state forestry subjects and supplier companies

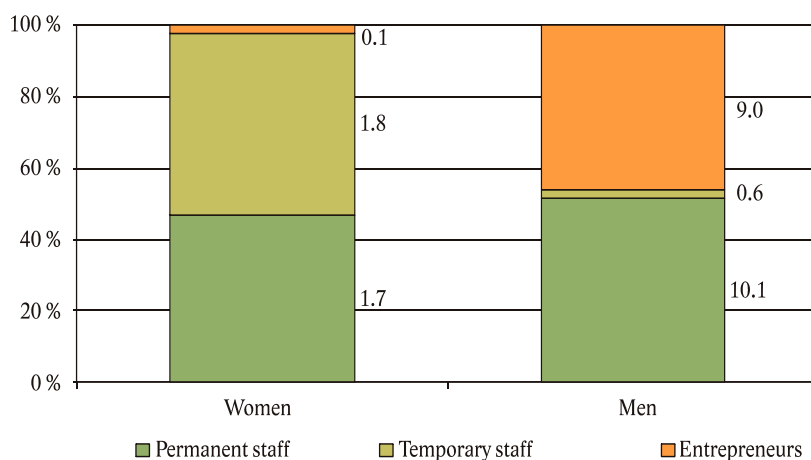


Figure 9.2-2 Workforce by employment category

Source: SO SR

Table 9.2-1 State Forests of SR, s.e., workforce

Indicator	2000	2005	2006
Administrative staff	3 739	2 765	2 797
Workers	9 318	1 901	1 881

Source: State Forests of SR, s.e.

With respect to the on-job gender statistics, the sector is still very much dominated by male workforce, the fact clearly illustrated by a 3:1 male-female-employment-rate. In state organizations, the 2006 rate was 76.3 percent to 23.7 percent in favour of male employees.

In the Register of Organizations of SO SR, there were 12, 224 registered subjects active in SCEA 02. From this figure, more than 8, 800 registrations belonged to occasionally active natural persons entered in the Register of Tax Information System.

Table 9.2–2 Workforce by education (%)

Education	2005			2006		
	Total	Female	Male	Total	Female	Male
Basic	10.5	20.0	8.2	9.2	17.1	6.6
High school	73.0	56.7	77.0	78.7	68.6	82.1
University	16.5	23.3	14.8	12.1	14.3	11.3

Source: SO SR

The average monthly earnings in the sector rose by 10.9 percent compared to 2005. The average monthly earnings in organizations with 20+ employees rose by 18.6 percent to 21, 759 SKK whilst the average sectoral monthly earnings adjusted by statistical estimate to reflect unrecorded earnings reached 17, 232 SKK, which represented 91.9 percent of the average earnings in national economy.

Sickness and occupational injuries

The forest sector traditionally belongs to industries with a high rate of occupational injuries and diseases. Increased incidence of work-related injuries is directly contributed to a number of factors including peculiarities of working in forest environment. unpredictable climatic conditions, difficult terrain and heavy machinery. The most vulnerable groups of workers include felling, skidding and hauling crews. In 2006, the Public Health Office of SR registered 1, 558 forest sector employees (36 women) working in risk class occupations.

Table 9.2–3 Overview of forest sector workforce exposed to health risk factors

Risk	Excess vibrations	Excess noise	Chemical substances	Long-term excess and unilateral load
Male	933	1 458	73	40
Female	3	19	20	0

Source: Public Health Office of SR

Incidence of newly arising occupational diseases has considerably decreased. With respect to the above described occupational risks, the most common diseases include Lyme disease and diseases induced by vibrations and excess machinery noise.

Table 9.2–4 Occupational diseases and other work-related health problems

Year	Indicator	Total	Disease							
			Vibration disease	Noise induced impaired hearing	Lyme disease	Other				
						Total	Including			
							24	26	29	47
2000	a	63	37	4	0	22	2	15	5	0
	b	18.0	19.6	28.0	0	13.5	3.0	14.1	15.8	0

Table 9.2–4 – contd.

2005	a	41	14	0	21	6	0	2	4	0
	b	14.9	14.4	0	13.3	21.5	0	19.0	22.8	0
2006	a	36	16	3	10	7	0	0	6	1
	b	18.7	16.8	20.7	17.8	23.3	0	0	24.5	16.0

Source: National Centre for Health Information

Legend: a – No of cases, b – average No of risk-subjected years, 24 – Infectious diseases and parasitary diseases except for tropical infectious diseases, parasitary diseases and diseases transmittable from animals to humans, 26 – Diseases transmittable from animals to humans directly or through carriers, 29 – Diseases from long-term excess unilateral extremity load affecting bones, joints, tendons, and nerves, 47 – Other work-related health problems

The trend in occupational injuries observed last year reflected a gradual transfer of production forestry operations into the external environment (outsourcing). This fact resulted in a decreased number of work related injuries of permanent staff employed by state forest enterprises. As for statistics for work related injuries in the non-state sector, figures provided by the National Work Inspectorate are incomplete because of a lack of available data. Injuries of shareholders of land associations and co-owners of private forests are registered as non-work injuries even if they directly result from forest jobs.

The most common underlying causes of serious and fatal injuries are insufficient personal abilities for the conduct of particular jobs and the use of dangerous working methods and procedures. Majority of the injuries can be attributed to the following: material; burden; shifted or in other way manipulated items; falls.

Table 9.2–5 Incidence of work-related injuries

Year	Employment category	Injuries in total	Fatal		Serious		Other	
			Male	Female	Male	Female	Male	Female
2000	Employees	612	2	0	3	1	534	72
	Tradesmen	2	1	0		0	1	0
2001	Employees	571	7	0	7	0	512	45
	Tradesmen	8	3	0	3	0	1	1
2002	Employees	507	1	0	10	0	451	45
	Tradesmen	3	2	0	1	0	0	0
2003	Employees	382	4	2	7	1	318	50
	Tradesmen	2	2	0	0	0	0	0
2004	Employees	206	1	0	5	0	178	22
	Tradesmen	5	3	0	2	0	0	0
2005	Employees	176	1	0	7	0	146	22
	Tradesmen	3	2	0	1	0	1	0
2006	Employees	137	8	0	16	0	95	18
	Tradesmen	0	0	0	0	0	0	0

Source: National Work Inspectorate

9.4. Summary Forestry Economic Account (SFEA)

At present, SFEA is formed by a set of five accounts: production; pension generation; enterprise profit; acquisition of non-financial assets; changes in net equity.

SFEA provides information on the origin of goods, their use, economic processes and associations within the industry in a particular accounting term. For the future, suggestions exist to introduce the system of integrated environmental and economic accounts for forests (IEEAF) which would take due account of other factors, damage/improvement of natural production factor in particular.

Table 9.4–1 Summary indicators of SFEA 2006

Indicator		Unit	State sector	Non-state sector	Total
Production account					
1	Utilisable production (timber felling)	thousand m³	4 767	3 590	8 357
2	Final production (log grades)		4 511	3 283	7 794
3	Average timber realization		SKK/m³	1 441	1 364
4	Value of final timber production	million SKK	6 502	4 478	10 980
5	Value of final production		2 697	340	3 037
6	Value of final production in total		9 199	4 818	14 017
7	Intermediate consumption		4 737	1 184	5 921
8	Gross added value		4 462	3 634	8 096
9	Consumption of fixed assets		489	350	839
10	Net added value		3 973	3 284	7 257
Pension generation account					
11	Employee bonuses	million SKK	2 280	1 380	3 660
12	Other taxes from production		558	290	848
13	Other production subventions		116	146	262
14	Net pension from independent activities		1 251	1 760	3 011
Enterprise profit account					
15	Accepted rent	million SKK	144	30	174
16	Paid interests		3	6	9
17	Paid rent		162	40	202
18	Net business profit		1 086	1 714	2 800

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI 2007), Balance sheet Uč POD 3-02, Quarterly report POD 2-01, Les V 4-01

All main indicators of production account, pension generation account and enterprise profit account given in current prices (total production value, gross added value, net added value, net pension and net profit) show a moderate increase from 2000 onwards, except for a slight variation in 2001 (Table 9.3.2). The significant growth of net pension from independent activities and net business profit was in 2006 associated with the increased volume of other subventions into production and decreased rates of taxes from other production.

Table 9.4–2 Trends in SFEA indicators in current prices (current transaction accounts)

Indicator	Unit	2000	2001	2002	2003	2004	2005	2006	Index 2006/ 2005
Production account									
1 Utilisable production (timber felling)	thousand m ³	6 218	6 185	6 260	6 652	7 268	10 190	8 357	0.820
2 Final production (log grades)		5 791	5 720	5 607	6 257	7 198	9 287	7 794	0.839
3 Average timber realization	SKK/m ³	1 227	1 341	1 375	1 335	1 315	1 223	1 409	1.152
4 Value of final timber production	million SKK	7 104	7 567	7 748	8 355	9 468	11 355	10 980	0.967
5 Value of final other production		1 996	2 072	2 039	1 878	1 851	2 399	3 037	1.266
6 Value of final production in total		9 100	9 639	9 787	10 233	11 319	13 754	14 017	1.019
7 Intermediate consumption		3 989	4 210	4 471	4 747	4 669	6 328	5 921	0.936
8 Gross added value		5 111	5 429	5 316	5 486	6 650	7 426	8 096	1.090
9 Consumption of fixed assets		813	764	791	842	820	834	839	1.006
10 Net added value		4 298	4 665	4 525	4 644	5 830	6 592	7 257	1.101
Pension generation account									
11 Employee bonuses	million SKK	3 891	4 034	4 078	3 831	3 678	4 175	3 660	0.877
12 Other taxes from production		182	187	182	432	1 589	1 588	848	0.534
13 Other production subventions		507	517	440	322	165	153	262	1.712
14 Net pension from independent activities		732	961	705	703	728	982	3 011	3.066
Enterprise profit account									
15 Accepted rent	million SKK	130	80	51	117	144	174	174	1.000
16 Paid interests		71	29	18	47	14	8	9	1.125
17 Paid rent		126	124	120	136	115	191	202	1.058
18 Net business profit		685	902	625	649	756	974	2 800	2.875

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI 2007), Balance sheet Úč POD 3-02, Quaterly report POD 2-01, Les V 4-01

9.5. Ownership and exploitation of forests

The current classification of forest ownership and exploitation, given in Table 9.4–1, is based on the Register of Forest Owners and Tenurers. The Table clearly shows that the process of restitution of forest ownership and tenure is still awaiting completion. Non-state subjects



Figure 33 Timber production represents the main source of income for forest owners

currently manage 43.9 percent from the total area of Slovak forests. The largest percent of still unresolved forests is in the category of private forests. This fact is primarily caused by the character of private property, majority of which are of a very limited size, of individual or shared ownership, and impossible to identify in the field. Furthermore, there is still a group of forest owners who are yet to claim their property.

Table 9.5–1 Forests by ownership and tenure

Subjects	Area of forest crop land					
	As at 31 December 2005		As at 31 December 2006			
	Ownership	Tenure	Ownership	Tenure	Ownership	Tenure
	ha		%			
State	807 753	1 130 786	794 047	1 083 537	41.1	56.1
Non-state, of which:	1 011 096	800 859	1 032 680	848 512	53.4	43.9
Private	275 243	121 372	289 897	139 961	15.0	7.2
Community	480 160	459 162	489 677	492 065	25.3	25.5
Church	65 242	47 449	59 427	38 817	3.1	2.0
Agricultural cooperatives	2 635	4 106	3 834	5 080	0.2	0.3
Municipal	187 816	168 770	189 845	172 589	9.8	8.9
Unknown	112 796	—	105 322	—	5.5	—
Total	1 931 645	1 931 645	1 932 049	1 932 049	100	100

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI)



10. RESEARCH, EDUCATION, CONSULTING AND PUBLIC RELATIONS

10.1. Forest research

Scientific and research projects commissioned under MA SR were in 2006 conducted by research staff at the National Forest Centre – Forest Research Institute Zvolen (NFC-FRI Zvolen). NFC-FRI also manages a network of research stations in Liptovský Hrádok, Gabčíkovo, Banská Štiavnica, Košice and the Research Station and Museum (RSM) of SF TANAP. Other forest research bodies outside the sector include the Faculty of Forestry (FF) of TU Zvolen and the Institute of Forest Ecology of the Slovak Academy of Sciences (IFE SAS) in Zvolen.

Scientific and research activities were mainly funded through various sector supported research projects, grants of the Agency for Research and Development Support (ARDS), projects of the Scientific and Grant Agency (SGA) of ME SR and SAS, projects of scientific and technical collaboration, and applied research of ME SR. Certain educational activities were also funded through projects of the Cultural and Educational Grant Agency (CEGA). Lastly, there were a number of activities supported from developmental schemes of ME SR.

In 2006, research institutions were involved in projects dealing with forestry issues on a global and regional scale, especially those associated with global climate change, role of forests in cultural landscape, post-calamity development in the Tatra Mts., forest biomass use, etc. Most recent results of scientific & research projects are published by particular researchers or respective institutions. In 2006, the following scientific periodicals continued to be published: *Forestry Journal* (NFC-FRI), *Folia oecologica* (IFE SAS), *Acta Facultatis Forestalis* (FF TU Zvolen), and *Studies on the TATRA National Park* (RSM TANAP).



Figure 34 Research demonstration object on Hukavský grúň (PLA Polana, 850m altitude)

Table 10.1–1 Scientific & research projects

Organization	No of projects					
	International			National		
	5 RP	6 RP	Other	SGA	ASRD	Other
NFC-FRI Zvolen	—	2	13	—	14	8
RSM TANAP	—	—	3	1	1	5
FFTU	1	4	1	27	2	5
IFE SAS	—	2	8	5	12	5

Source: Special questionnaire of MA SR, 2007

Table 10.1–2 Publications by particular research institutions

Organization	No of published works (based on the publication categories from Regulation No 13/2005-R*)				Other publications
	Book publications (scientific monography type)	Other book publications	Publications in current scientific journals, patents + discoveries	Other reviewed publications	
NFC-FRI Zvolen	1	8	5	151	94
RSM TANAP	—	—	—	32	27
FFTU	6	29	10	328	n.a.
IFE SAS	—	—	21	39	18

*Regulation of the Ministry of Education of SR No 13/2005-R of 31 August 2005 laying down rules for bibliographic registration and categorisation of publication activities and responses.

Source: Special questionnaire of MA SR, 2007

Traditionally prolific is the collaboration with similarly profiled scientific bodies home and abroad. The majority of cooperation activities include participation in joint scientific projects and scientific or research events, such as conferences, symposia, seminars and workshops. In 2006, the aforementioned fora served to publish scientific knowledge and research results from forestry and other related disciplines; in total, more than 30 different events were organised or jointly organised by the abovementioned scientific and research institutions.

10.2. Forestry education

Graduate and undergraduate courses and programmes in forestry subjects are offered at the Faculty of Forestry of TU Zvolen. In addition, there are three specialised forestry colleges in Banská Štiavnica, Liptovský Hrádok, Prešov which offering high school equivalent education, and five forestry apprenticeship schools (Banská Štiavnica, Bijacovce, Modra Harmónia, Sigord and Tvrdosín).



Figure 35 Outdoor education in informal forest setting

Table 10.2–1 Courses at FFTU Zvolen 2005–2006

1 st degree - Bachelor		
Major	Course	
	Day	Distance
	Students	
Forestry	152	41
Applied zoology and game management	41	9
Total	193	50
2 nd degree– Master's		
Major	Course	
	Day	Distance
	Students/Graduates	
Forestry	356/94	121/17
Forest ecology	46/7	0
Applied zoology and game management	65/12	0
Forest enterprise management & economics	69/20	0
Total	536/133	121/17
3 rd degree – PhD		
Major	Course	
	Day	Distance
	Students/Graduates	
Forest management planning	8/2	11
Forest phytology	7	6/1
Silviculture and forest protection	5	3/3
Machinery and technology in forest production	2	3
Forest amelioration	2	3
Plant protection	2	6/1
Silviculture	3	3
Hydroamelioration	2	0
Machinery and mechanization in agricultural and forest production	5	10/2
Sectoral and diversified economics	1/1	17/1
Ecology	3	9/1
Total	43/3	71/9

Source: Special questionnaire of MA SR, 2007

In 2006, a total of 150 forest engineers completed graduate courses. 12 PhD students were last year awarded the degree by the Scientific Board of FFTU Zvolen.

Forestry colleges and forestry apprenticeship schools annually jointly produce an estimated 350 students finding employment in forestry practice as well as technical and administrative positions.

Further education of forest sector workforce was in 2006 centrally managed by NFC–Institute for Training and Education of Forestry and Water Management Staff of SR () based in Zvolen. At present, NFC-ITEFWMS holds accreditation to 26 different educational programmes and courses.

Table 10.2–2 Courses available at forestry colleges and forestry apprenticeship schools

School	Course (form)	No of students /graduates
Forestry college	Forestry (full college education)	755/208
	Forestry & forest management (advanced education)	19/19
	Rural tourism (advanced education)	21/0
Total		795/227
Forestry apprenticeship schools	4-year courses with leaving exams	
	Artistic & artisan wood craftsmanship	393/43
	Forest machinery operator	155/53
	Agro entrepreneur – rural tourism	81/0
	3-year courses	
	Forest production mechanist	230/77
	Mechanist/repairman– forest machinery and equipment	99/55
	Mechanist/repairman – road vehicles	39/8
	Forest landscape professional	6/0
	Advanced courses	
	Forestry	140/64
	Mechanization of agriculture and forestry	41/14
	2-year course	
	Forest production	114/41
Total		974/321

Source: Special questionnaire of MA SR, 2007

Table 10.2–3 Educational activities managed by NFC-ITEFWMS

Programme/course	No	No of participants
Specialised courses for administrative staff	35	845
Courses for forest workers	21	130
Courses for forest owners	9	226
Language courses	6	76
Total	71	1 277

Source: NFC-ITEFWMS

Table 10.2–4 Centre of Further Education

Short-term courses	No	No of participants
Silviculture of broad-leaf forests	3	74
Integrated felling-hauling technologies	3	67
Selection forests	2	48
Legal and economic aspects of forestry business	1	18
Financial & organizational stabilisation of forest sector	1	25
Drafting projects for agricultural land afforestation	2	41
Drafting projects for forest sector	2	42
Erosion & erosion control measures	1	20
Third Age University	TUZVO courses – 9	144
	Ornamental and medicinal plants – 1	23
Total	16	502

Source: Special questionnaire of MA SR, 2007

The Centre for Further Education (CFE), formally attached to TU Zvolen, in 2006 in addition to the ongoing *Third Age* University project further organised and held 15 short-term courses focusing on current issues of forestry practice.

10.3. Consulting services

A further progress of forestry activities implemented in rural setting would be hard to achieve without the proficient network of consulting, advisory and assistance services responding to a wide range of non-state forest owners needs. The need is imminent when we realize that non-state forests cover almost a half of the total forest area in Slovakia. The implementation of Council Regulation (EC) No 1782/2003 and the *Strategic Plan of Rural Development for 2007–2013* require active consulting based on a new institutional basis. The new conception of agricultural consulting system (ACS), drafted by MA SR in response to regulation provisions, delegates NFC responsibility for managing consulting services in the forest sector. In 2006, consulting services in forestry area were offered by the following bodies: NFC; IFE SAS Zvolen; FF TU Zvolen; state administration bodies. The assistance was offered also through the sectoral magazine *Les / Slovenské Lesokruhy*. NFC in 2006 provided advisory and assistance services in a number of areas including:

- Forest protection
 - Diseases of planting material in forest nurseries – 13 events
 - Outbreak of bark beetle, measures against Gypsy moth, monitoring – 193 events
 - Training and field demonstration – 38 events
- Silviculture
 - demonstrations and field presentations of new technological methods in forest regeneration – 5 events
 - demonstration in natural forest regeneration – 1 event
- Consulting services for appraisers / lecture on methods of drafting appraiser report – 2 events
- Sectoral Operational Programme *Agriculture and Rural Development*
 - assistance with the preparation of agricultural land afforestation projects – 8 events
 - assistance with categorisation of forest properties into non-profit investments – 5 events

Bodies of state administration on forests and game management, District Forest Offices in particular, continually performed duties related to consulting through regular organization of events and meetings with forest owners, tenurers and certified forest managers based within their jurisdiction. Further assistance was also provided by state administration staff on general assemblies of land associations.

The bimonthly sectoral magazine *Les / Slovenské Lesokruhy*, which is published jointly with MA SR, was in 2006 distributed in 5,000 circulation numbers. Special magazine supplements provided free-of-charge offered forestry public with copies of regulations enforced in forestry sector (mostly executive regulations to Forest Act).

10.4. Public relations

Public relations activities are based on a wide range of different communication tools and methods using planned, long-term measures and activities focused on the improvement of public awareness, public education and creation of positive image of forestry among public. There is a number of tools to imply in achieving this objective, one of which is open public dialogue. This method is seen as one of the most effective tools of improving credibility of foresters among important target groups and contributes to improved public informing and reinforcement of foresters' professional pride. Active forms of communication with public have gradually proven most efficient and firmly established themselves in both state and non-state forestry institutions. The need for systematic approach to public relations has led to establishment of a working group coordinating communication activities with public. NFC-ITEFWMS has drafted a conception of public relations and communication strategy in forestry which defines objectives, target groups, communication messages, tools, and measures for achievement of particular objectives. In addition, a special action group consisting of representatives of key forestry institutions has been set up to coordinate public relations in the sector. The group includes representatives of the following entities: MA SR; State Forests of SR, s.e.; NFC; TU Zvolen; Military Forests and Estates of the Slovak Republic, s.e. Pliešovce (MFE SR); the State Forests of TANAP (SF TANAP); Board of the Associations of Non-state Forest Owners; SLsK; etc. Its primary ambition is to create basis for a common forestry communication strategy and unite foresters and forestry institutions in presentation of their work and enforcement of their statutory interests.

In 2006, a number of joint projects including several forestry institutions were carried out. In addition to *Tree Day* – the annual, highly acclaimed event held in Open Air Forestry Museum in Čierny Balog, the Forests of the Slovak Republic, s.e., Banská Bystrica also organised a special *Christmas Tree Just for You* event for 9, 000 children from children homes. Among other successful events organised in cooperation



Figure 36 Formation of positive attitude to forests starts in childhood

with non-governmental organizations it is worth mentioning *Forest Protection School* and *2006 Forest Protection Award* competition.

NFC trained forest educators from the Forests of the Slovak Republic, s.e., presented their forest pedagogy skills also at the *Danube Day* event. The event was organised in cooperation with ME SR. Further projects included annual events *Forests for Children* in Poltár and *Young Friends of Forest* near Počúvadlo Lake. Both events, which were organised by the Slovak Republic, s.e., FE Levice in collaboration with other partners including NFC, Sitno Nature School, Forestry College in Banská Štiavnica and St. Anton Museum, focused on the enhancement of environmental awareness in schoolchildren. There were also a number of events held in cooperation with SHU including *Levice Hunting Days*, *Zemplín Hunting Days*, and *St. Hubert Days*. In addition, a small museum to commemorate achievements of Ľudovít Greiner, a former employee of FE Revúca, was opened. A special *Remembrance Day* to commemorate the 50th anniversary of the Kulichova valley tragedy was held in attendance of the President of SR. SF TANAP organised an educational competition for schoolchildren called *Travelling Owl*. This event represented a climax of year-long work with primary schools and was attended by 550 children from 24 classes of 15 different schools.

A number of new forest nature trails were also opened. These trails are very popular among public, children in particular as they provide one of the best opportunities to learn more about forests and their inhabitants in natural setting. Last year, SF TANAP opened the following public facilities: Educative Geology Site Podmuráň; Forest Nature Trail Zverovka; and Forest Nature Trail Podbanské. At the same time, the Forests of the Slovak Republic, s.e., also opened a number of other forest nature trails including: FNT Banský jarok (FE Levice); FNT Morské Oko (FE Sobrance); FNT Trenčianske Teplice (FE Trenčín); FNT Teplý vrch (FE Rimavská Sobota); and FNT Smolnícká Osada (FE Košice). Similarly, Municipal Forests Dobšiná and Košice in between them opened several forest trails; these trails considerably increased tourism potential and attractiveness of mentioned areas.

The Forests of the Slovak Republic, s.e., continued in their initiative of establishing a network of forest information centres formally attached to their FE and FD. These centres offer a broad range of public services and promotion materials on forestry traditions and nature peculiarities of respective regions.

An estimated 80, 000 visitors took part in the 33rd international agricultural and food fair *Agrokomplex* held in Nitra. The 15th international exhibition of machinery, tools, equipment and materials for wood-processing industry and the 9th forestry exhibition *Lignumexpo – Les 2006* were also accompanied by a number of associated events for forestry professionals and public alike.



11. ORGANIZATIONAL AND INSTITUTIONAL STRUCTURE OF SLOVAK FORESTRY

11.1. State administration on forestry and game management

The state administration on forestry and game management (SAFGM) is represented by the Ministry, the central body of SAFGM, Regional Forest Offices, and District Forest Offices (so called specialised state administration). SAFGM also performs duties in state interest defined by specific regulations (e.g., § 4, Sec. 5 of Act No 193/2005 Coll; Act No 217/2004 Coll; Act No 545/2004 Coll; Act No 23/1962 Coll in the wording of the pursuant regulations; Act No 181/1995 Coll on land associations in the wording of the pursuant regulations; Act No 291/1996 on varieties and seeds in the wording of the pursuant regulations).

The Ministry performs duties defined in § 58 of enforced Act No 326/2005 Coll on forest. In 2006, two new units, namely the Unit for Forest Resource Management and Forest Policy (710) and Unit of State Administration on Forestry and Game Management (720) were established within its Forestry Department. The latter among other things is also responsible for management and inspection of state administration on forestry and game management at regional and district level. The structure of enquiries (4, 000) submitted to the unit 720 in relation to formal enquiry procedure based on Act No 326/2005 Coll on forests, Act No 23/1962 Coll on game management in the wording of the pursuant regulations, and Act No 71/1967 Coll on formal administrative procedure in the wording of the pursuant regulations is given in the following Table.

Table 11.1–1 Enquiry structure

Enquiry	Total
Administrative procedure regulated by Act No 326/2005 Coll	13
Administrative procedure not regulated by Act No 326/2005 Coll	676
Administrative procedure regulated by Act No 23/1962 Coll	46
Other enquires dealt with by state administration on game management	1 070

Source: Forestry Department, MA SR, 2007

Regional forest offices (RFOs) are legal public entities funded by government through ministerial budget. These offices through their budgets also support the operation of district forest offices (DFOs) under their territorial jurisdiction. RFOs belong to the network of public offices; employees of district offices are also included in the public servants category.

RFOs also perform tasks of an appeal body against the first level decisions



Figure 37 Bodies of state forestry & game management administration perform duties related to forest management regulation and control

issued by respective DFO. They also represent an official body of territorial administration on forestry as defined by § 59 of Act No. 326/2005 Coll. Within the scope of game management competences, RFOs conduct duties in accordance with administrative order; they also organise advanced hunting exams and perform inspection tasks.

Table 11.1–2 Key duties of specialised SAFGM by particular RFO 2006

Duty	Bratislava	Trnava	Trenčín	Nitra
	No			
Enquiry for administrative procedure regulated by Act No 326/2005 Coll	311	175	291	87
– of which enquiry based on § 7 of Act No 326/2005 Coll	59	49	53	27
Enquiry not regulated by administrative procedure under Act No 326/2005 Coll	952	521	1 007	201
Execution of supervision as defined by § 62 of Act No 326/2005 Coll	13	35	203	194
– of which No of issued measures	2	0	13	17
Fines imposed based on § 63, 64 of Act No 326/2005 Coll	10	19	23	4
Enquiry for administrative procedure regulated by Act No 23/1962 Coll	160	185	174	212
Enquiry not regulated by administrative procedure under Act No 23/1962 Coll	1 635	2 109	1 868	2 916

Duty	Žilina	Banská Bystrica	Prešov	Košice	Total
	No				
Enquiry for administrative procedure regulated by Act No 326/2005 Coll	805	591	569	403	3 232
– of which enquiry based on § 7 of Act No 326/2005 Coll	133	97	67	78	563
Enquiry not regulated by administrative procedure under Act No 326/2005 Coll	1 727	2 439	1 701	2 378	10 926
Execution of supervision as defined by § 62 of Act No 326/2005 Coll	569	268	830	102	2 214
– of which No of issued measures	71	30	52	4	189
Fines imposed based on § 63, 64 of Act No 326/2005 Coll	132	66	125	104	483
Enquiry for administrative procedure regulated by Act No 23/1962 Coll	482	524	1 216	1 496	4 449
Enquiry not regulated by administrative procedure under Act No 23/1962 Coll	1 386	3 427	2 020	1 286	16 647

Source: Forestry Department, MA SR, 2007

District forest offices operate and issue administrative decisions independently of RFOs. They represent the first level body in procedures provided for by § 60 of Act No 326/2005 Coll. In line with § 60 provisions and Act on game management they also perform other specific tasks. All bodies of SAFGM within their territorial jurisdiction also perform duties of state supervision on forests including monitoring and investigative/inspection tasks related to Forest Act observance. In addition, they also monitor the observance of special and binding regulations executing the Act and decisions based on Act's provisions.

11.2. Subjects managing and commercially exploiting forests

11.2.1. State forests

Forests owned by state are managed by state forestry bodies, namely the Forests of the Slovak Republic, s.e., Forest-agricultural Estate Ulič, s.e. (FAE), and SFTANAP. All these bodies are administered by MA SR. Another body, MFE SR, s. e., Pliešovce is managed by MD SR. In addition to state forests, state bodies also manage forests of forest owners who to date for various reasons have not claimed their properties and forests leased from non-state subjects. For training purposes, the Forests of the Slovak Republic, s.e., contractually leased 913 hectares of forest to the Forestry College (FC) in Banská Štiavnica; 392 hectares were leased to Forestry College Prešov and 10, 688 hectares to TU Zvolen. The college in Liptovský Hrádok conducts its training on the contract basis with the Forests of the Slovak Republic, s.e.

Table 11.2.1–1 Key statistics on forests managed by state forestry bodies

State forestry bodies	Forest crop land (ha)	Growing stock (thousand m ³)	Growing stock of mature stands (thousand m ³)	Mature stands area (ha)
The Forests of the Slovak Republic, s.e.	943 356	217 032	64 301	163 595
SFTANAP	38 598	7 699	670	1 859
FAE Ulič, s.e.	20 789	4 132	875	2 345
MFE SR, s.e.	68 592	14 823	5 113	14 947
FC, TU	12 202	3 244	1 352	2 827
Total	1 083 537	246 930	72 311	185 573

Source: *Compendium of Slovak Forestry Statistics (SFMP, PFI), 2007*

11.2.2. Non-state forests

Non-state forests include private, community, church, agricultural co-op and municipal forests. Legal and organizational forms represented in non-state sector include land associations with/without corporate entity status, Ltd companies, shared companies, natural persons with/without business licence, and special units (commercial, semi-budgetary) of municipal offices.

Table 11.2.2–1 Key information on non-state forests

Subjects	Forest crop land (ha)	Growing stock (thousand m ³)	Growing stock of mature stands (thousand m ³)	Mature stands area (ha)
Private	139 961	34 267	11 299	28 335
Community	492 065	109 323	30 411	80 368
Church	38 817	9 314	2 597	6 853
Agricultural co-ops	5 080	1 060	391	1 214
Municipal	172 589	42 886	13 889	32 812
Total	848 512	196 850	58 587	149 582

Source: *Compendium of Slovak Forestry Statistics (SFMP, PFI), 2007*

11.2.3. Commercial sector

In 2006, the volume of operations realized by commercial enterprises continued to grow.

Table 11.2.3–1 Operations realized for forestry organizations by commercial enterprises

Organization	Artificial regeneration		Forest protection		Cleaning		Felling		Skidding		Timber hauling	
	ha	%	ha	%	ha	%	thous and m ³	%	tis. m ³	%	thous and m ³	%
Forests of the Slovak Republic, s.e.	4 126	100	31 512	98	15 677	99	3 767	96	3 680	96	2 148	63
SFTANAP	331	90	957	45	1 018	94	322	85	382	100	142	46
FAE Ulič, s.e.	0	0	0	0	475	66	28	46	27	44	2	3,3
State organizations under MA SR	4 457	98	32 469	94	17 170	97	4 117	94	4 089	95	2 292	61
MFE SR, s. e.	390	67	2251	92	1290	75	257	81	233	79	197	81
FC, TU	21	43	140	34	145	68	33	52	38	60	6	8,5
Other state organizations	411	65	2391	83	1435	74	290	76	271	76	203	65
Σ State organizations	4 868	94	34 860	93	18 605	95	4 407	93	4 360	94	2 495	61
Non-state subjects	1591	39	11 212	36	3822	44	1 593	44	1 447	43	976	47
Total	6 459	70	46 072	67	22 427	79	6 000	72	5 807	73	3 471	56

Source: NFC-FRI Zvolen

Table 11.2.3–2 Trends in operations realized by commercial enterprises in the Forests of SR, s. e.

Year	Artificial regeneration		Forest protection		Cleaning		Felling		Skidding		Timber hauling	
	ha	%	ha	%	ha	%	thousand m ³	%	thousand m ³	%	thousand m ³	%
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
2006	4 126	100	31 512	98	15 677	99	3 767	96	3 680	96	2 148	63
Index 2006/2000	7.2		44.6		2.6		2.7		2.5		10.4	

Source: NFC-FRI Zvolen

11.3. Professional forestry bodies

11.3.1. National Forest Centre

The National Forest Centre (NFC) was established on January 1, 2006 as a semi-budgetary organization of MA SR. NFC establishment represented a merger of three formerly

independent forestry institutions – the Forest Research Institute Zvolen, the Lesoprojekt Zvolen, and the Institute for Training and Education of Forestry and Water Management Staff of the SR.

The Centre is an umbrella organization for four specialised institutes (NFC-Forest Research Institute; NFC-Institute for Training and Education of Forestry and Water Management Staff of the SR; NFC-Institute for Forest Resources and Information; NFC-Lesoprojekt) and has three main organizational units: Office of Director General; Office of Deputy Director for Economics; Office of Deputy Director for Services and Logistics. NFC – Appraiser Office is organizationally attached to the Office of Director General.



Figure 38 NFC-Forest Research Institute Zvolen is involved in multidisciplinary research in all areas of forestry and other natural environment related fields

NFC aims

- To support effective and economically sustainable link between research, education and further development of forest sector
- To enhance education and advisory services for forest owners, forest managers and commercial enterprises conducting business in forest sector
- To provide a wide range of users at a national and international level with modern information services based on effective methods of forestry data gathering, processing, evaluation and presentation
- To explore alternative sources of funding and improve the effectiveness of applying for foreign funding (projects and supporting grants) to finance NFC activities and facilitate improvement of its technological base

Table 11.3.1–1 Employee structure 2006

Category		Employees to December 31 2006
Total		435
Of which	A. Researchers	69
	B. Technicians and other personnel	22
	C. Support staff	4
	Research and development staff in total	95
	D. Administrative staff with university degree	184
	E. Administrative staff with high school degree	111
	F. Workers	45

Source: NFC, 2007

Table 11.3.1–2 Activity structure 2006

Activity group	% from NFC total
Government funded scientific and research projects	1.1
Sector funded research projects	16.0
Projects supported by ARDS	8.3
SOP projects	3.3
International projects	1.6
Educational programmes and projects	2.2
Development related activities	39.2
FMP elaboration	28.3

Source: NFC, 2006

Note: ARDS – Agency for Research and Development Support, SOP – Sectoral Operational Programme.

11.3.2. St Anton Museum

Since January 1 2006, the museum also manages Forestry and Wood Technology Museum in Zvolen. Thanks to its last year's pro-active policy, it managed to enlarge its collection by 168 forestry related photographs. In five Slovak towns, second repetition of a very popular exhibition *Tatra Windthrow through Emotions and Senses* was held last year. It was seen by 5, 895 visitors. In the same term, Podpolianske Museum in Detva held the exhibition titled *Wood Etudes VI – Wooden Toys*. Generosity of sponsors, including the Forests of the Slovak Republic, s.e., MFE, s.e. Pliešovce, Willing Zvolen and many others, made possible opening of a new exposition called *Trees of Our Forests*. During the ENVIROFILM 2006 festival, the museum prepared a series of old films dubbed *Forest Nursery and Afforestation Operations of the Past*. The museum's branch office in Krupina assisted with the organization of children drawing competition called *Forest Life*. Other traditional events worth mentioning included the 8th national competition *Wood Etudes – Wooden Accessories* and the 5th *Green Objective* competition, the latter being a competition for young documentary photographers. Last year, the competition was held under the title *Forest* with 120 aspiring photographers sending in their works. Competition photographs were in April–May 2006 on display at the Ministry of the Environment of SR.

A considerable number of museum's events is organised for young generation, children in particular. Various events organised in partnership with different schools and the Slovak Environmental Agency were in 2006 attended by 2, 692 children.

11.4. Interest groups and associations

11.4.1. Slovak Forestry Chamber

At present, the Slovak Forestry Chamber (SFC) features four regional chambers with seats in Banská Bystrica, Bratislava, Košice, and Žilina and 255 members including group membership (legal entities). Its 13th General Assembly, in which the new chairman, board members and board of trustees were elected, was held on September 21 2006.

11.4.2. Associations of non-state forest owners

There were four associations of non-state forest owners (ANFO) operating in Slovakia in 2006. These associations organised owners with the total forest area of 536, 132 hectares. There is, however, quite a substantial group of non-state forest owners (264, 727 hectares of forest or 33 percent) who do not belong to any association. The Council of Non-state Forest Owner Associations, an informal umbrella body of non-state forest owners representing the interests of the Slovak Association of Municipal Forests, the Slovak Union of Republic Associations of Non-state Forest Owners, the Slovak Union of Diocese Forests and the Union of Owners of Private, Community and Municipal Forests of Banská Bystrica Region, was established on January 1 2006. The main objective of the Council is to coordinate efforts on enforcement of lawful interests of non-state forest owners in practice.

11.4.3. Association of Forest Sector Employers

The Association of Forest Sector Employers (AFSE) was in 2006 formed by 21 different employer bodies including: 2 state forest enterprises, 5 Lesostav companies, 11 municipal forest bodies, 2 school forest enterprises, and 1 semi-budgetary organization.

11.4.4. Slovak Hunting Union

The Slovak Hunting Union (SHU) last year unified more than 50 thousand hunters and with its membership base it belonged to large interest groups in Slovakia. Its regional and district branches closely cooperated with local state administration on game management. They organised game trophy shows and in cooperation with state veterinary and food administration they implemented practical measures improving game health. SHU also held hunting exams and shows of hunting dog breeds. In addition, the union managed top dog events on both national and international level. Of great importance were its activities in the area of hunting shooting and professional training of young hunters. SHU also organized a number of various workshops and exhibitions (e.g., *Levice Hunting Days*).

11.4.5. Council for Economic and Social Understanding in the Forest Sector

The Council for Economic and Social Understanding in the Forest Sector was established in 2006 to replace the former Council for Economic and Social Partnership in Forestry. The Council is formed by three representatives from each of the following: MA SR, the Association of the Forest Sector Employers of the Slovak Republic and the Trade Unions of Timber, Forest and Water Industries.

11.4.6. Slovak Forest Certification Association

The Slovak Forest Certification Association (SFCA) represents a National Governing Body PEFC (Programme for the Endorsement of Forest Certification Schemes) in Slovakia. SFCA was established as an independent voluntary professional association of legal entities with interests in forest sector. SFCA was accepted for a full member of the PEFC Council (Pan European Forest Certification Council) on its 6th General Assembly held in Luxembourg in 2002. At present, SFCA has 16 members divided by their interests into 3 main chambers: the Chamber of Forest Owners; the Wood-processing Industry Chamber; and the Chamber of Other Interest Groups.

In 2006, the agreement was signed with the Slovak National Accreditation Service (SNAS) to formally accredit the certification proces. At the same time, consultations on the accreditation guidelines were carried out and official SNAS guidelines published. Other actions included training seminar on technical aspects of sustainable forest management and chain of custody certification and workshop for SNAS appraisers.



12. INDUSTRIES AND ACTIVITIES ASSOCIATED WITH FOREST AND ITS FUNCTIONS

12.1. Nature and landscape protection

Forests represent the commonest and most diverse terrestrial ecosystem. Their landscape-ecological and environmental contributions are multiple and irreplaceable. Forests play a decisive role in the creation and conservation of the environment and maintenance of ecological balance. To December 31 2006, the total area of forests in protected areas including their buffer zones (BZ) was 1, 134, 943 hectares (23.1 percent of the national territory); extent of the area is based on the provisions of Act No 543/2002 Coll on nature and landscape protection. Forest cover in the areas under 2nd-5th level of protection is a staggering 72.6 percent.

Table 12.1–1 Protected areas by particular protection level

Level	Protected area	Area ha	% of the SR area	Forest cover %
2.	PLA, zone D-PLA Horná Orava: 491 260 ha, BZ NP, zone D-PIENAP: 267 052 ha	758 312	15.46	66.1
3.	NP, zone C-PIENAP ^{*)} : 247 354 ha, BZ NR: 102 ha, BZ NNR: 543 ha, BZ PP ^{**)} : 159 ha, PS: 597 ha, BZ PS: 2 419 ha zone C-PLA Horná Orava: 14 793 ha	265 967	5.42	91.1
4.	PS: 4 575 ha, BZ NR: 158 ha, PP: 884 ha, NR: 3 381 ha, BZ NNR: 1 935 ha, BZ NR ^{*)} : 48 ha, BZ NNM 27 ha, zone B-PIENAP: 837 ha, NNM: 58 ha, NPR: 2 346 ha, zone B-PLA Horná Orava: 3 356 ha	17 605	0.36	64.8
5.	NR and private NR: 9 466 ha, NNR: 81 393 ha, NM ^{**)} : 659 ha, NNM: 1 ha, zone A-PIENAP: 277 ha, zone A-PLA Horná Orava: 1 263 ha	93 059	1.90	74.0

Source: ME SR, 2006

^{*)}area outside small-scale protected areas, ^{**)}NM "from law" are not included

The State Nature Conservancy of SR (SNC) registers a total of 9 national parks (NP), 14 protected landscape areas (PLA), and 703 small-scale protected areas (SSPAs).



SSPAs on forest land are further divided into the following categories: national nature reserves (NNR), nature reserves (NR), national nature monuments (NNM), nature monuments (PP), and protected sites (PS).

In 2006, SNC focused on tasks associated with the implementation of national lists of NATURA 2000. The national list of proposed Special Protection Areas (SPAs) was approved by Government Decree No 636/2003 and features 38 areas with the total area of 1, 236, 545 hectares (25.2 percent of the Slovak territory). Overlap of the area of proposed SPAs with the national network of protected areas accounts for 55.1 percent of the national territory. To date, 5 SPAs have officially been designated including

Figure 39 Majority of most valuable protected sites are situated on forest land

SPA Syslovské polia (2006), SPA Dolné Považie (2006), SPA Malé Karpaty (2005), SPA Lehnice (2005), and SPA Horná Orava (2004). For the remaining 33 SPAs, respective regulations have been drafted.

Table 12.1–2 National parks (NPs)

National park	Area (ha)	of which FP	Buffer zone area	of which FP
Tatra National Park (TANAP)	73 800	69 829	30 703	6 446
Pieniny National 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
Total	317 890	279 796	270 128	146 766

Source: ME SR

Note: FP – forest plots

Table 12.1–3 Protected landscape areas (PLAs)

Protected landscape area	Area (ha)	of which FP (ha)
PLA Vihorlat	17 485	16 648
PLA Malé Karpaty	64 610	57 608
PLA Východné Karpaty	25 307	19 509
PLA Horná Orava	58 738	33 317
PLA Biele Karpaty	44 568	29 978
PLA Štiavnické vrchy	77 630	56 275
PLA Poľana	20 360	17 102
PLA Kysuce	65 462	46 600
PLA Ponitrie	37 665	34 867
PLA Záhorie	27 522	11 825
PLA Strážovské vrchy	30 979	24 104
PLA Cerová vrchovina	16 771	10 612
PLA Latorica	23 298	3 963
PLA Dunajské luhy	12 284	6 359
Total	522 679	368 767

Source: ME SR

Table 12.1–4 Small-scale protected areas (SSPAs)

SSPA category	No. of forest SSPA	Area without BZ (ha)	of which FP (ha)	BZ area (ha)	of which FP (ha)
National nature reserve	208	83 801	66 511	3 134	548
Natural reserve	292	12 861	9 000	168	69
National nature monument	52	59	18	1 340	807
Nature monument	112	1 544	802	148	130
Protected site	39	5 201	476	5	5
Total	703	103 466	76 807	4 795	1 559

Source: ME SR

The national list of proposed Sites of Community Interests (pSCIs) has been approved by the Government of SR (Decree No 239/2004). 382 different areas with the total of area of 574, 745 hectares (11.7 percent of the Slovak territory) have been entered on the list. On some 86 percent, their area overlaps with the current national network of protected areas. The remaining 14 percent is important for conservation of habitats and species habitats at present insufficiently covered by the existing network. 86.5 percent of these areas are situated on forest land; 68, 000 hectares of the area is currently undergoing review procedure aimed at further tightening of their protection regimes.

Based on the outcomes of a number of biogeographic seminars held in 2005–2006, Slovakia has been requested to complete her national list by adding additional areas. In the Alpine biogeographic region, new areas should sufficiently cover 39 deficit habitats and species whereas in the Pannonian biogeographic region, the request is for 44 deficit species and habitats.

The most preserved forest communities of national and international importance have been inscribed or nominated for the UNESCO World Heritage List. Forests around a unique system of 959 caves located in the Slovak Karst (Ochtinská Aragonite Cave, Dobšinská Ice Cave and Stratenská Cave), already under UNESCO protection, have yet to receive a special status. The special protection status has so far been granted only to the 227.89 hectares of forest in the 616.69 hectares buffer zone of Domica Cave.

Forest-related sites nominated for UNESCO protection include the following: karst valleys of Slovakia; nature reserves of Tatra NP; natural and cultural landscape of the Danube River; mycoflora of the Bukovské vrchy Hills; and the Carpathian beech primeval forests featuring NNR Stuzica – Bukovské vrchy Hills, NNR Havešová, NNR Rožok, and NNR Vihorlat. In a broader context of cultural and spiritual dimension of forests, 477 different sites with 1,317 specimens of protected trees have received special acknowledgement. On top of that, there are a number of other protected sites and protected landscape elements (arboreta, orchards, gardens, etc.) found in Slovakia.

12.2. Water management

One of the top priorities of forest management is to ensure optimum fulfilment of water conservation related forest functions and services. Forests protect soil against destruction processes induced by surface waters, avalanches and other destructive elements. Through their foliage, craggy bark and abundant litter, trees and forests decrease the speed of water dispersion and favour slow but total infiltration of rainwater. Slovak functional typisation recognises five main “water” forest functions: water conservation, water purification, soil protection (erosion and deflation control), streamside protection, and avalanche control. From the total area of Slovak forests, an estimated 65 percent of them are directly linked to water benefiting functions.



Figure 40 Forests play an irreplaceable role in water quality improvement and runoff regulation

Table 12.2–1 Area of forest crop land by particular “water” function

Function	Degree of importance (ha)		Total (ha)
	Primary	Secondary	
Water conservation	72 840	147 024	217 220
Water purification	13 270	28 063	40 608
Erosion control	246 801	790 753	1 027 901
Deflation control	3 327	7 743	11 032
Avalanche control	4 643	—	4 695
Streamside protection	916	—	892
Total	341 797	973 583	1 302 348

Source: *Compendium of Slovak Forestry Statistics (SFMP, PFI), 2007*

12.3. Technical amelioration and minor watercourses

According to Government Decree No 731/1995, technical amelioration and torrent control in forests are the responsibility of respective forestry bodies. At present, the implementation of measures



Figure 41 Management of small watercourses considerably reduces flood risk

is severely limited and constructions built in the past are slowly disintegrating because of poor maintenance. In 2006, the total of 22 million SKK was invested into torrent control measures by the Forests of the Slovak Republic, s.e. State organizations managed by MA SR currently oversee 17, 867 km of minor watercourses, 187 km less than in 2005. Last year's spring and summer flooding generated forest sector total damage of 203 million SKK, of which 31.3 million SKK was the cost of damage on minor watercourses.

Table 12.3–1 Damage on watercourses managed by state forestry organizations (thousand SKK)

	2000	2001	2002	2003	2004	2005	2006	Total
Damage	30 850	5 165	55 448	0	11 006	9 760	31 265	143 494
Compensated	8 247	385	26 420	0	3 889	0	0	38 941
Difference	-22 603	-4 780	-29 028	0	-7 117	-9 760	-31 265	-104 553

Source: Information on economic results of state forestry enterprises and organizations, 2006

Table 12.3–2 Structure of flooding damage (thousand SKK)

Cost type	Forestry organizations			
	State		Non-state	Total
	Total	of which the Forests of the Slovak Republic, s.e.		
Flooding damage:				
– minor watercourses	31 265	28 265	—	31 265
– forest road network	96 531	95 596	70 870	167 401
– buildings	90	90	—	90
– forest stands	—	—	175	175
– flood induced timber floating	—	—	927	927
Total	127 886	123 951	71 972	199 858
Control measures:				
– minor watercourses	1 269	1 269	—	1 269
– forest road network	1 945	1 945	—	1 945
Total	3 214	3 214	—	3 214
TOTAL				
– minor watercourses	32 534	29 534	—	32 534
– forest road network	98 476	97 541	70 870	169 346
– buildings	90	90	—	90
– forest stands	—	—	175	175
– flood induced timber floating	0	0	927	927
Total	131 100	127 165	71 972	203 072

Source: MA SR

In 2000, the Slovak Government approved the *National Programme of Flood Control 2000–2010*, which has been seriously deficient in measures due to imposed long-term financial constraints.

12.4. Wood-processing industry

Trends and current economic performance of the industry described by key fiscal indicators are given in Tables below.

Table 12.4–1 Volume of timber processed in particular sectors of wood-processing industry (thousand m³)

Sector	Actual figures			Projection for 2007	Outlook for 2008
	1990	2005	2006		
Timber industry	2 300	5 069	4 271	4 400	4 400
Pulp & paper-making industry	1 880	2 302	2 313	2 400	2 400
ΣWood-processing industry	4 180	7 371	6 584	6 800	6 800

Source: MI SR, 2007

Note: Figures for 2004–2008 do not include fuelwood consumption.

Table 12.4–2 Selected economic indicators of wood-processing industry (million SKK)

Indicator	Industry	Actual figures				Projection for 2007	Outlook for 2008
		1990	2004	2005	2006*		
Revenue	TI	9 138	17 138	19 940	22 200	22 500	23 000
	FI	10 088	30 175	33 000	32 650	33 000	33 500
	PPI	29 564	39 958	45 343	51 500	52 000	53 000
	WPI	48 790	87 271	98 283	106 350	107 500	109 500
Costs	TI	9 455	16 451	19 166	21 800	22 050	22 500
	FI	10 282	29 996	31 439	30 800	31 000	31 400
	PPI	28 225	38 787	43 635	49 550	49 900	50 800
	WPI	47 962	85 234	94 240	102 150	102 900	104 700
Economic result before tax	TI	-316	687	774	400	450	500
	FI	-194	180	1 561	1 850	2 000	2 100
	PPI	1 339	1 171	1 708	1 950	2 100	2 200
	WPI	829	2 038	4 043	4 200	4 550	4 800
Workforce	TI	—	8 604	9 924	9 778	9 900	10 200
	FI	—	11 158	11 830	12 144	12 200	12 400
	PPI	—	7 615	7 458	7 371	7 400	7 400
	WPI	—	27 377	29 212	29 293	29 500	30 000

Source: MI SR, 2007

*Expected results

Note: TI – timber industry, FI – furniture-making industry, PPI – pulp & paper-making industry, WPI – wood-processing industry (total).

Table 12.4–3 Production and consumption of wood-based products in m³ and tonnes per capita

Grade	1990	2000	2005	2006
Lumber production	0.269	0.191	0.487	0.453
Lumber consumption	0.260	0.290	0.336	0.245
Wood chipboard production	0.057	0.043	0.058	0.064
Wood chipboard consumption	0.057	0.046	0.061	0.064
Fibreboard production	0.012	0.012	0.050	0.055
Fibreboard consumption	0.090	0.090	0.061	0.770
Pulp production (tonnes)	0.085	0.114	0.113	0.116
Pulp consumption (tonnes)	0.076	0.114	0.114	0.116
Paper and cardboard production (tonnes)	0.082	0.173	0.159	0.165
Paper and cardboard consumption (tonnes)	0.061	0.154	0.094	0.096

Source: MI SR, Statistical Office of SR, NFC-FRI Zvolen

The rapid interannual increase in the supply of timber into wood-processing industry (up by 2, 100 thousand m³ compared to 2005) was contributed to salvage of remaining timber from the 2004 windthrow. Compared to 2004, the volumes for 2006 indicate growth by 600 thousand m³. The increase was partially sourced from 2004 windthrow salvage; the remaining 300 thousand m³ of primarily hardwood timber were imported from abroad.

12.5. Use of timber and other renewable resources for energy production

Current prices of basic fuels and especially their expected continual rise have generated an increased interest in alternative sources of energy, timber in particular. A number of modern timber-burning facilities have been co-funded from SOP funds managed by MI SR and ME SR. Nevertheless, financial support for timber energy is a far cry from being satisfactory. In 2006, only a handful of communal heat sources in Nová Dubnica, Kysucké Nové Mesto, Handlová, and Dolný Kubín were in operation. In addition to existing facilities, three new heat-producing plants were opened in Šala, Malacky and Hriňová. In industry and energy production, two facilities for combined power generation were under development in Banská Bystrica and Zvolen.

The demand for fuelwood among inhabitants of rural areas, particularly in mountainous and hilly regions of Slovakia, has also been continually growing with forest sector being its chief supplier. The Forests of the Slovak Republic, s.e., annually produce an estimated 120 thousand tonnes of chipwood, of which around 20 percent is exported mainly to Hungary and Austria. Smaller producers of fuel chips process wood from non-state forests combined with waste wood from wood-processing industry. Waste from mechanical wood processing forms an estimated 25 percent of fuelwood supplies.



Figure 42 Timber and chipwood represents an important source of renewable energy

Table 12.5–1 Current utilizable volume of fuel dendromass

Producer	Yearly volume (thousand tonnes)	Energy equivalent PJ
Forest sector	2 310	21.8
Σ Wood processing facilities	1 928	23.2
Σ Agriculture	170	1.6
Σ Communal sphere	230	2.4
Total	4 638	49.0

Source: NFC-FRI, 2007

Note: The figures do not include wood sourced from so-called “white plots.”

Table 12.5–2 Yearly volume of dendromass for energy production

Year	Chipwood			Fuelwood and other ¹⁾			Total		
	thousand tonnes ²⁾	TJ	%	thousand tonnes	%TJ	%	thousand tonnes	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
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	150	1 425	0.2	660	6270	0.8	810	7695	1.0
2007 ^{*)}	180	1 710	0.2	670	6365	0.8	850	8075	1.0
2008 ^{**)}	220	2 090	0.3	680	6460	0.8	900	8550	1.2

Source: NFC-FRI, 2007

Note: ^{*)}prediction, ^{**)}outlook, ¹⁾fuelwood and waste wood, post-harvest debris and snags, ²⁾chipwood and wood for chips production.

Other renewable sources of energy are in forestry used only sporadically. The total installed capacity of small-capacity hydrostations is 60 KW; additional 35 kW used for water heating is generated by solar pannels. Power and heat are generated for home consumption only. In the future, other renewable sources of energy available in forest sector can alternatively be used for:

- solar energy for water heating for domestic consumption;
- water energy for power generation for domestic consumption or national grid;
- geothermal energy as heat purchased from other subjects;
- wind energy to produce power for domestic consumption or national grid;

Exploitation of other renewable sources of energy in forestry, except perhaps for solar energy, represents an activity unrelated to its main scope of interest and depends on specific natural and economic conditions (e.g., investments, running cost).

12.6. Hunting, agriculture and food industry

Hunting

At present, the total area of hunting grounds in Slovakia is 4,414,407 hectares. Agricultural land covers 2,314,000 hectares, forest land 1,972,000 hectares, water bodies 53,000 hectares and other land the remaining 75,000 hectares of the territory.

In 2006, there were 1, 818 designated hunting grounds in Slovakia. The number also included 30 independent hunting enclosures and 12 specialised pheasantries. The average area of hunting grounds was 2, 428 hectares (down by 963 ha when compared to 3, 391 hectares in 1990). The Forests of the Slovak Republic, s.e., Banská Bystrica last year managed 134 self-operated hunting grounds with the total area of 509, 829 hectares (11.5 percent). In addition, there were 27 other hunting grounds covering the area of 158, 356 hectares (3.6 percent) managed by other state-run organizations (MFE SR, s. e., Pliešovce, school forests, SFTANAP, FAE Ulič, s.e., etc.). Non-state subjects managed 69 self-operated hunting grounds with the area of 194, 193 hectares (4.4 percent). Hunting associations (HA) managed 1, 346 hunting grounds covering 3, 037, 433 hectares (68.8 percent). Furthermore, there were 242 hunting grounds with the area of 514, 598 hectares (11.7 percent) leased by non-member subjects of the Slovak Hunting Union (SHU), such as shared companies, Ltd., etc. As in previous years, the most substantial growth was recorded in the category of leased hunting grounds not associated with SHU (up by 16 with the area of 20, 135 hectares).

The largest hunting grounds are still in the category of state-run organizations (5, 865 hectares on average; their area, however, decreased by 2, 120 hectares when compared to 2005). Also of considerable area are self-operated hunting grounds of the Forests of the Slovak Republic, s.e., Banská Bystrica (3, 805 hectares). These hunting grounds represent a core basis for ungulates breeding in all officially recognised hunting regions. The smallest average area is generally recorded in the category of other leased hunting grounds (2, 126 hectares) and hunting associations' grounds (2, 257 hectares). Although the number of hunting grounds has been continually increasing, their average area has at the same time decreased. Likewise, a number of hunting grounds leased to HA of SHU have been continually falling. The trend is reverse in a category of hunting grounds leased by SHU non-members, such as shared companies, Ltd., etc.

State administration on game management

The state oversees hunting and game management activities, regulated by the provisions of Act No 23/1962 Coll. on hunting in the wording of the pursuant regulations, through MA SR, its central administration body, and respective regional /district forest offices representing bodies of specialised state administration.

District forest offices are bodies of first level state administration on game management. In 2006, their competences were regulated by Act No 23/1962 Coll. on hunting in the wording of the pursuant regulations and included the following: approval of game management and shooting plans; inspection of plan obligations fulfilment; and finally the inspection of game husbandry. In addition, they issued, withdrew and extended validity of shooting licences, issued decisions on game damage compensations based on Hunting Act, issued decisions on hunting grounds recognition, decisions on contracts on hunting rights transfer, and decisions on disciplinary offences of shooting licence holders.

Regional forest offices issued decisions on appeals against the first level decisions of state administration bodies. At the same time, they coordinated and inspected activities of these bodies. Regional forest offices in Nitra and Prešov in addition to their common duties also coordinated a large-scale ecological game management in officially recognised hunting regions.

In 2006, MA SR had to deal with the total of 1,114 enquires related to conduct of state administration on game management. These enquires included applications for review of decisions issued outside standard appeal procedure, appeals against decisions of first level bodies based on Act No 71/1967 Coll on administrative procedure in the wording of the pursuant regulations, enquires for the review of conduct of state administration bodies, applications for access of public to information based on Act No 211/2000 Coll on free access to information and on amendment of specific acts in the wording of the pursuant regulations. MA SR also conducted inspection activities specified in Act No 10/1996 Coll on state administration inspection.

Main game species

At the end of March 2006, figures for ungulates spring stock excluding fallow deer were higher than those the year before. The observed increase in the number of particular species of ungulates, except for roe deer, is in many regions of Slovakia undesirable due to ever increasing damage to forests and agricultural crops. Despite the improvement on the 2005 red deer shooting record, the number of shot specimens was still well below the 2006 plan. On the other hand, shooting figures for fallow deer, mouflon and wild boar experienced a fall. The increase in the spring stock was observed in pheasant and hare populations. Their shooting numbers, however, did not reflect positive stock trends because of lower natural population increase attributed to harsher weather conditions. Spring stock numbers of other small game species were, on the contrary, in decline.



Figure 43 Roe deer is the most common ungulate species in Slovak forests

Table 12.6–1 Ungulates and small game species

Species	No of specimens				
	Spring stock	Shooting	Trapping	Mortality	Re-stocking
Red deer	41 105	12 888	87	1 341	51
Fallow deer	8 010	2 208	35	215	27
Mouflon	9 717	2 286	118	183	82
Roe deer	87 324	17 313	3	3 682	2
Wild boar	27 175	17 820	135	528	107
Pheasant	187 244	110 514	26	21 433	118 709
Hare	208 946	17 560	7 422	4 879	259
Rabbit	593	0	0	19	211
Partridge	15 579	10	0	529	350
Wild duck	0	11 695	0	300	1 200
Wild turkey	92	134	0	2	211

Populations of large predators, such as bear, wolf and lynx have statistically increased in the reviewed period. At present, they are considered too large for existing habitats. With respect to other rare game species, their numbers interannually increased except for capercaillie, whose numbers fell compared to 2005. Shooting of rare game species is strictly regulated. Instead of 63 specimens of bear planned for shooting only 16 were shot. Approved shooting limits for bear have not been met long term now and the situation is worsening rather than improving with time. The main cause of this unfavourable trend is the restrictions imposed by ME SR and administrative procedures resulting from various initiatives of nature conservation NGOs. Long-term under-shooting has resulted in unsustainably high local population of bear. As a result, the incidence of man-beast encounters, property damage and undesirable migration of younger specimens to new habitats unsuitable for bear has increased. It is thus imperative to review the current strategy of bear shooting to improve their regulation. In the assessed period, 91 specimens of wolf and 8 alpine chamois were shot. At the same time, a significant increase in the chamois numbers (665) was observed when compared to 2005 (625).

Table 12.6–2 Rare game species

Species	No of specimens			
	Spring stock	Approved shooting	Actual shooting	Mortality
Chamois	665	9	8	0
Bear	1 577	63	16	13
Wolf	1 219	115	91	1
Lynx	1 172	0	0	7
Wild cat	1 481	0	0	4
Otter	380	0	0	7
Grouse	1 568	0	0	1
Capercaillie	1 064	0	0	0
Hazel grouse	7 555	49	2	29
Marmot	992	0	0	0
Elk	1	0	0	0
Bison	31	0	0	0
Beaver	297	0	0	7

Source: Slovak Hunting Yearbook, 2006

Economics

The total income generated from the hunting & game industry reached last year 207, 990 thousand SKK, which with the total expenditure of 231, 663 thousand SKK generated the earnings deficit of 23, 673 thousand SKK. Surplus earnings of 9, 211 thousand SKK were recorded in self-operated hunting grounds of the Forests of the Slovak Republic, s.e. Hunting grounds leased to hunting associations of SHU generated moderate surplus earnings of some 205 thousand SKK. Other categories of hunting grounds including those leased to LtD and shared companies or funded from internal budgets generated deficit earnings.

12.7. Rural development

In 2004–2006, funding for rural development came from two main schemes: the *Rural Development Plan of the Slovak Republic* (RDP) and the *Sectoral Operational Programme Agriculture and Rural Development* (SOP ARD). Under the SOP Basic Infrastructure, rural development funding was provided through the Article 33 measure (Regulation No 1257/1999) – Restoration and Development of Villages and Conservation of Rural Heritage. Measures under RDP and SOP ARD were financed from the European Agricultural Guidance and Guarantee Fund (EAGGF) – RDP from its Guarantee and SOP ARD from its Guidance Section.



Figure 44 An estimated 60 percent of the Slovak territory have a rural character

Rural Development Plan

The global priority of RDP is to *increase effectiveness of agricultural production and improve quality of life of rural populations (Multifunctional agriculture and sustainable*

rural development). Actions leading to the fulfilment of this objective and other rural development objectives were supported through the measures of the following RDP priorities:

- Priority 1: Development of sustainable rural economy (rural economy and employment)
- Priority 2: Protection and improvement of rural environment

Sectoral Operational Programme “Agriculture and Rural Development”

Funding for rural development actions was also provided through SOP ARD whose main objective – *Multifunctional agriculture and sustainable rural development*, aimed to improve quality of life of rural populations, improve their livelihoods, create decent social environment, and lastly assist with general development of rural economy. Funding was granted mainly from the measures of Priority 2 – *Support for Sustainable Rural Development*.

Programming period 2007–2013

In the new programming period 2007–2013, funding for rural development is allocated through the *National Strategic Plan of Rural Development 2007–2013* (NSPRD) based on Council Regulation (EC) No 1698/2005 on support for rural development. Respective programme measures are financed from the European Agricultural Fund for Rural Development (EAFRD). Draft version of NSPRD was approved by the Government of SR on December 6, 2006 (Decree No 1016/2006). NSPRD represents a baseline document for EAFRD funding as well as a reference tool for the formulation of 2007–2013 *Rural Development Programme*. Approved NSPRD will facilitate coordination with other national and EU policy tools by defining lines to prevent overlapping of activities associated with the exploitation of EC tools.

NSPRD aims to “*enhance competitiveness of agriculture, food industry and forestry and improve the environment and rural livelihoods by introducing sustainable management practices in agriculture and forestry.*” The priorities are given to ecological management of rural areas, improvement of life in rural regions and diversification of rural economies. Greater diversification of economic activities would in return generate new job opportunities and improve education possibilities for rural youth. At the same time, it would also bring more funding for village restoration and community development. This approach should gradually lead to mitigation of economic differences between particular rural regions of the country. Supported measures are divided into the following strands:

- enhancement of competitiveness of agricultural and forestry sector;
- enhancement of the environment and rural landscape;
- improvement of the quality of life in rural areas and diversification of rural economy;
- implementation of the *Leader* approach.

12.8. Recreation and health benefits of forests

Forests provide a wide range of social benefits to mankind. Among others, they also host and protect sites and landscapes of high cultural, spiritual and recreational value. Through their recreational and health benefits they significantly improve the quality of life of local communities, particularly in urban setting.

Recreational values of forests are nowadays perhaps the most recognised and appreciated social function of forests since these have gradually become a much favoured venue for outdoor recreation and leisure pursuits. Forest environment has a positive impact on restoration of physical and mental power as it helps compensate for multiple stresses of modern life, particularly in highly urbanised areas. In the vicinity of major settlements, the boom in visitor and recreational facilities has recently been witnessed. Green spaces such as urban forests, inner city & suburban parks and other recreational zones with paths, cycling tracks and special picnic areas are becoming increasingly popular for a growing number of city dwellers.

The positive impact of forests, forest tree species in particular, on human health and wellbeing has been known for years. Beneficial properties of forests aid in treatment of many physical and mental disorders; even greater is their role in preventive medicine. Forest communities create aesthetically pleasing natural environment well responding to physical and mental needs of patients and convalescents. Restorative & healing power of forests, spa forests in particular, is thus undeniable although often difficult to measure.



Figure 45 Recreational values of forests are enhanced by biologically rich and aesthetically pleasing forest environment

At present, the area of Slovak forests primarily designated for recreation and wellness is only 1.65 percent. Despite a very low area of these forests, generally all Slovak forests, regardless of their ownership, are accessible to public for recreation and collection of non-wood forest products. The restrictions to unlimited public access are few and they are often associated with forest protection measures (fire control, game breeding, safety reasons in military forests, conservation of ecologically sensitive sites, etc.).

Table 12.8–1 Area of forests primarily designated for recreation (ha)

Function	Function rate (thousand ha)			Total (thousand ha)
	Principal	Secondary	Next to secondary	
Function	28,720	1,026	—	29,746
Spa&wellness	3,181	0,221	—	3,402
Publicly accessible forests	—	—	1 808,500	1 808,500
Total	31,901	1,247	1 808,500	1 841,648

Source: Compendium of Slovak Forestry Statistics (SFMP, PFI), 2007

The primary management objective in forests important for recreation and wellness is to create optimal conditions for the fulfilment of their recreation potential without compromising biodiversity and production. At the same time, the negative impact of various forms of outdoor pursuits and leisure activities should be kept at minimum since excess recreation and overcrowding naturally increase the incidence of forest damage (vegetation trampling, fire lighting, wildlife disturbance, littering, illegal waste dumping, etc.).

12.9. Land use reform

The Land Use Reform (LUR) is a collective term for a broad spectrum of various measures of regulatory, technical, economic and ecological nature facilitating improvement of living conditions of rural communities and creating preconditions for integrated development of rural areas.

The need for LUR is based on a current status of ownership and tenure rights to agricultural and forest land resulting from the historical development of economic, regulatory and societal conditions in Slovakia.

The reform is supervised by MA SR through its network of regional and district land offices which are responsible for practical aspects of the reform implementation. Regulatory framework is provided by Act No 330/1991 Coll. on land use reform in the wording of the pursuant regulations. Funding for LUR projects is provided from the state budget (projects for 111 cadastre areas) and the EU through particular SOP (projects for 226 cadastre areas). The main objective of land use reform is to:

- eliminate discrepancy between cadastre registered ownership and actual ownership;
- unify and adjust small, ill-shaped and inaccessible plots to fit needs and plans of individual land owners.

There are a number of reasons behind LUR; as for forest land, the most important are the following:

- need for rational spatial distribution of land ownership and other associated immovable forest property;
- need for the introduction of forest management changes and forest production restrictions due to designation of buffer zones, protected areas and due to other societal interests;
- need for substantial adjustment of forest and agricultural plots.

In 2006, baseline documents for the 35 LUR projects covering the total forest area of 18, 424.53 hectares were provided (26 different project holders). At the same time, a total of 19 projects were completed on the forest area of 1 289.03 hectares whilst official statements were issued to 7 cadastre areas. LUR outcomes have already projected into the review of cadastre records which form the obligatory baseline document for both spatial planning documentation and FMP elaboration.



13. INTERNATIONAL FORESTRY INITIATIVES

13.1. Global and European processes on forests

United Nations Forum on Forests

The Sixth Session of the United Nations Forum on Forests (UNFF) brought wide consensus on issues related to four common global objectives for forests centred on strengthening various aspects of sustainable forest management. The four objectives include:

- need to halt reduction in global area of forests and need to step up efforts preventing forest degradation;
- need to increase value of economic, social and environmental benefits of forests including improved living conditions of communities dependent on forests for their livelihood;
- need to significantly increase the area of protected forests and sustainably managed forests and increase the range of available forest products;
- need to reverse undesirable decline in the volume of official developmental assistance directed to sustainable forest management and mobilise new and additional sources of funding.

The Sixth UNFF Session contributed to gradual advancement of the so-called *International Agreement on Forests* (IAF), which provides basic global framework for international policy on forests. Recently, the member countries have reached consensus on its further priorities and policy directions thus providing prerequisite for positive development of IAF initiatives and fulfilment of agreed global objectives.

Despite the recent apparent progress, future implementation of IAF actions will grossly depend on practical execution of agreed political obligations by particular UNFF member countries which can voluntarily choose the nature of implemented measures. This fact to a great degree limits the UNFF (UN) chances to exert international pressure on single countries to comply with the principles of sustainable forest management at a national level.

Forthcoming UNFF activities are focused on the development of structure and content of the non-obligatory regulatory tool for all types of forests which should be voted on at its Seventh Session in April 2007.

FAO European Forestry Commission

The Thirty-third Session of the European Forestry Commission (EFC) FAO was held on 23–26 May 2006 in Zvolen. The event was hosted by MA SR in close co-operation with NFC, FAO in Rome, and the United Nations Economic Commission for Europe (UNECE) in Geneva.

The Session hosted the representatives of EFC member countries as well as observers from various UN organizations, expert agencies and international intergovernmental and non-governmental organizations. EFC focused in particular on the following issues: enforcement of sustainable forest management in European forests; destruction of forests by natural disasters; intersectoral approach to issues related to the forest sector; and regional co-operation on forestry related issues.

The discussions also revolved around the issues focusing on timber as a renewable source of energy, voluntary codex of forestry practice, climate change, regional contribution to global processes, availability of information on enforcement of sustainable forest management, forest fires, etc.



Figure 46 Participants of the Thirty-third Session of the European Forestry Commission FAO during the session and in Vydrovo valley

UNECE Timber Committee

The Sixty-fourth Session of the UNECE Timber Committee (TC UNECE) was held on 2–7 October 2006 in Geneva. The main issue on the Session's agenda was a political forum on public procurement policy on timber and paper products and its impact on sustainable forest management and global timber trade. A number of different countries have now introduced guidelines and rules excluding state procurement of timber acquired illegally and/or coming from forests not managed in a sustainable way.

The Timber Committee further analysed actual situation on the global market with forest products and issued outlook for 2007. The discussions revolved around the strengthening position of China on the UNECE region markets with forest products following China's leading position in global export of forest products. China also ranks second only to the USA in the volume of its import and is the largest exporter of furniture with the main volume of its production destined for the US markets.

The Session also paid attention to issues related to the implementation of UNECE reform and its impact on TC workplan and fundamental objectives of the reform in fast developing international setting. In addition, the Session's participants centred on discussing various aspects of intersectoral co-operation at different policy levels including reinforcement of links between TC and committees of other UNECE sectors. As well as that, the review of actions held within the integrated TC workplan completed by presentations of particular specialist teams was given. At the Session, the workplan for 2007 was also approved.

13.2. Forestry and the EU

EU Forest Action Plan

On June 15 2006, the European Commission issued communication to the Council and the European Parliament on an EU Forest Action Plan [COM (2006) 302]. The

communication responds to the request of the Council to the Commission to present an EU Forest Action Plan in 2006. It has been prepared in close cooperation with the Member States and in consultation with stakeholders. It takes into account the report by the European Parliament on implementation of the EU Forestry Strategy.

The overall objective of the Action Plan is to support and enhance sustainable forest management and the multifunctional role of forests. The Plan primarily aims to contribute to achieving the objectives of the renewed Lisbon Strategy for growth and jobs and of the Gothenburg Agenda for sustainable development.

In the course of preparation of the EU Forest Action Plan, the Commission and the Member States have developed a common vision of forestry and the contribution forests and forestry make to modern society:

Forests for society: long-term multifunctional forestry fulfilling present and future societal needs and supporting forest-related livelihoods.

In accordance with the above vision, the Action Plan has four main objectives:

- improving long-term competitiveness;
- improving and protecting the environment;
- contributing to the quality of life;
- fostering coordination and communication.

The five-year Action Plan (2007–2011) consists of a set of key actions which the Commission proposes to implement jointly with the Member States. It also points out additional actions which can be carried out by the Member States according to their specific conditions and priorities with the support from existing Community instruments, although implementation may also require additional national instruments.

13.3. Forestry cooperation on national and international levels

The cooperation of the Slovak forest sector with foreign partners has been gaining on a momentum. International activities in the sector are managed by the following institutions:

Ministry of Agriculture of SR

MA SR is responsible for the coordination, conceptual and management activities related to international cooperation in the sector. It oversees formulation and implementation of foreign policy in the area of forestry consistent with the conception of official foreign policy of the Slovak Republic. The Section of International Relations and the Forestry Section were in 2006 jointly responsible for a broad range of international issues dealt with by the Ministry.

MA SR cooperates on issues of international cooperation with a number of other sectors of national economy, most often with the Ministry of Foreign Affairs of SR.



Figure 47 Publications represent one of the most tangible results of international cooperation

National Forest Centre

In 2006, NFC coordinated a broad range of various international activities directly related to scientific, research, educational, consulting, developmental and planning activities, some of which were tasks delegated by MA SR. The main projects included:

- Collaboration with international organizations. In this area, NFC coordinated its activities with MA SR, the Section of International Relations. NFC experts regularly took part in sessions organized by UNECE, UN ESC, FAO, OECD, IUFRO, JRC, and MCPFE.
- On 27–29 March 2006, NFC-FRI Zvolen hosted the international seminar “Policies on Assistance of Investment and Innovation in Rural Development.” The seminar was organised in joint cooperation with the MCPFE Liaison Unit in Warsaw and other national and international bodies and organizations.
- Participation in COST actions that belong to one of the oldest instruments supporting cooperation among scientists and researchers across Europe. NFC staff took active part in the following actions: *E42 Growing Valuable Broadleaved Tree Species*; *E43 Harmonization of National Inventories in Europe: techniques for Common Reporting*; *E45 European forest externalities*; *E51 Integrating Innovation and Development Policies for the Forest Sector*; *E52 Evaluation of Genetic Resources of Beech for Sustainable Forestry*.

- Fostering official developmental assistance: NFC is currently an implementing agency for two developmental projects in Serbia: *Developing Capacities of the Private Sector for SM of Forests in Serbia and Strengthening of Skills and Infrastructure for Protection and Regeneration of Forests in Serbia*.
- Other implemented projects: Equal – ways to enhancing social inclusion and equal opportunities in the labour market in forestry; Leonardo da Vinci – forest pedagogy project.

Technical University Zvolen

In 2006, university's international activities were focused on international dimension of university education fostering access to high quality education and widening education possibilities resulting from integration processes of the European academic area and the creation of open job market.

Within the framework of the SOCRATES programme, the university participated in the following sub-programmes: Erasmus (centralized & decentralized activities), Erasmus Mundus, Grundtvig and Minerva. Under the programme, 19 students and 8 lecturers were sent to exchange placements at 13 universities of 7 different European countries.

Under the framework of the INNO-FOREST project (Erasmus 1) *Integrating innovation and entrepreneurship in higher forestry education*, the university hosted an intensive summer course in which 27 students and 10 lecturers from 10 (7) European countries took part.

The university also participated in eight partnership projects run under the Sixth Framework Programme (FP6). The projects were in the following thematic areas: Integrated projects; *Excellence networks*; *Specific support programmes*; *Coordination of research activities*.

International students' activities were jointly coordinated by the International Association for the Exchange of Students for Technical Experience (IAESTE) and the International Forestry Students' Association (IFSA).

Forestry colleges and apprenticeship schools

The main volume of international activities was formed by programmes supported by various EU instruments. They primarily focused on mobility and exchange of experience in the field of education and included the following:

- Socrates/Comenius – bilateral and/or multilateral cooperation with the European partnering schools centred on acquisition of expert and language knowledge and experience;
- Leonardo da Vinci – mutual exchange of practical experience in the area of didactic-educational processes.

International activities of non-state forest owners

In 2004, the Union of Regional Associations of Non-state Forest Owners of Slovakia became a full member of the Confederation of European Forest Owners (CEPF) set up in Brussels.

The ongoing activities of the union's members include the interregional cooperation project *Robinwood* (RW) which is a part of the Interreg IIIC Programme. The project focuses on revitalization of rural areas through integrated management of forest sector. Slovakia is in this project represented by the Gemer Regional Association of Non-state Forest Owners.

Forests of the Slovak Republic, s.e.

In May 2006, the European State Forest Association (EUSTAFOR), a forum for the European state forest organizations, was set up in Brussels. The Forests of the Slovak Republic, s.e., were one of its 18 founding members from all across Europe.

Its recent international activities primarily focused on providing professional guides for foreign visitors of Slovak forests and those visiting Open Air Forestry Museum in Vydrovo valley, an outdoor forest exposition set up and managed by the abovementioned organization.

Table 13.3–1 Overview of participants in forestry related international events held in Slovakia 2006

Event	No of participants
Mobility, exchange programmes	300
Conferencies, excursions	1 500
Other	30

Source: NFC-FRI, 2007



14. ANNEXES

14.1. Tables

Table 1 Key fiscal indicators of state forestry organizations of MA SR

No.	Indicator	Unit	Factual figures				Estimate for 2007	Outlook for 2008
			1990	2004	2005	2006		
1	Earnings and revenue	million SKK	4 179	6 583	8 700	8 237	6 924	6 936
2	Timber earnings		2 301	5 250	7 021	5 972	5 397	5 592
3	Other earnings and receipts		884	1 236	1 675	2 265	1 527	1 344
4	Direct costs of silvicultural operations		511	586	828	880	764	779
5	Direct costs of felling operations		607	2 533	3 766	3 412	3 310	3 363
6	Total cost of silvicultural operations		776	814	1 066	1 154	1 004	1 024
7	Total cost of felling operations		970	3 435	4 544	4 333	4 174	4 243
8	Total production costs		4 016	6 121	8 483	7 827	6 871	6 884
9	Material costs including depreciation		1 853	3 212	3 476	4 004	3 820	3 869
10	Depreciation		557	378	394	405	427	428
11	Personnel costs		1 928	2 204	2 636	2 079	2 241	2 342
12	– labour costs		1 397	1 592	1 910	1 491	1 613	1 684
13	Economic result (profit, loss)		163	462	217	410	53	52
14	Total state subsidies		1 101	123	111	56	104	136
15	– state subsidies for forestry operations		994	6	4	0	0	0
16	– state investment subsidies			26	27	0	20	40
17	– state subsidies for other activities		107	91	80	56	84	96
18	Overdue assets		105	17	541	479	454	424
19	Overdue obligations by December 31		10	26	17	12	2	1

Source: PFI 2007, Green Reports, special questionnaire from forest owners and tenurers, analytical standards of state forest enterprises, sectoral statistical record Les V (MA SR) 5-01, Les F (MA SR) 7-01, Les V (MA SR) 1-04, Les D (MA SR) 2-04, Les P (MA SR) 6-01

Table 2 Key economic indicators of state forestry organizations of MA SR

No.	Indicator	Unit	Factual figures				Estimate for 2007	Outlook for 2008
			1990	2004	2005	2006		
1	Σ forest regeneration	ha	17 497	7 948	7 182	8 597	8 150	8 000
2	– artificial regeneration		14 308	4 595	4 597	4 553	4 200	3 950
3	Treatment of young forest stands		14 084	7 376	7 934	7 637	8 000	7 750
4	Protection of young forest stands		136 220	34 061	33 553	34 662	34 700	34 300
5	Forest protection (direct costs)	thousand SKK	41 000	64 286	88 247	132 471	136 500	127 900
6	Cleaning	ha	30 775	18 379	17 431	17 672	16 600	16 350
7	Thinning		35 384	31 590	25 005	26 488	26 950	27 600
8	Σ timber felling	thousand m ³	4 800	3 923	6 125	4 386	3 920	3 825
9	– conifer		2 501	1 979	4 222	2 565	2 100	2 000
10	– broadleaf		2 299	1 944	1 903	1 821	1 820	1 825

Table 2 – contd.

No.	Indicator	Unit	Factual figures				Estimate for 2007	Outlook for 2008
			1990	2004	2005	2006		
11	Σ incidental felling (from line 8)	thousand m ³	2 415	1 484	4 234	2 224	1 570	1 490
12	– conifer		1 572	1 281	4 005	1 985	1 300	1 210
13	– broadleaf		843	203	229	239	270	280
14	Σ timber purchase		49	10	5 003	12	10	10
15	– conifer		30	5	4 995	5	5	6
16	– broadleaf		19	5	8	7	5	4
17	Σ timber sale		4 732	3 955	5 707	4 129	3 610	3 530
18	– conifer		2 490	2 065	3 885	2 331	1 980	1 940
19	– broadleaf		2 242	1 890	1 822	1 798	1 630	1 590
20	Stumpage sale (from line 17)		60	17	675	31	30	20
21	– conifer		25	13	672	8	15	15
22	– broadleaf		35	4	3	23	15	5
23	Σ domestic timber sale		4 398	3 575	5 152	3 939	3 480	3 400
24	– conifer		2 307	1 885	3 459	2 282	1 940	1 900
25	– broadleaf		2 091	1 690	1 693	1 657	1 540	1 500
26	Timber export (from line 17) ⁾		334	380	555	190	130	130
27	– conifer		183	180	426	49	40	40
28	– broadleaf	million SKK	151	200	129	141	90	90
29	Σ investments		541	311	615	803	800	710
30	Construction works		274	130	243	346	400	360
31	Machinery & equipment		267	174	325	453	355	310
32	Other ^{**)}			7	47	4	45	40
33	Forest road network (December 31)	km	18 672	8 963	8 970	8 997	9 003	9 009
34	Unpaved forest roads (December 31)		13 474	6 972	6 975	6 979	6 986	6 993
35	Length of managed watercourses		22 958	18 467	18 054	17 867	18 054	18 048
36	Area of managed forest properties	thousand ha	1 829	1 105	1 090	1 039	1 026	1 016
37	Economic staff	persons	33 693	7 394	6 212	5 344	5 363	5 300
38	– workers		23 700	4 103	3 069	2 309	2 293	2 245
39	Average monthly earnings	SKK	3 456	16 993	19 051	22 837	24 796	26 404

Source: PFI 2007, Green Reports, special questionnaire from forest owners and tenurers, analytical standards of state forest enterprises, sectoral statistical record Les V (MA SR) 5-01, Les F (MA SR) 7-01, Les V (MA SR) 1-04, Les D (MA SR) 2-04, Les P (MA SR) 6-01, Uč POD 1-01, Uč POD 2-01

Note: ⁾exports realized on behalf of forest owners/tenurers, ^{**)e.g.}FMP elaboration, other intangibles

Table 3 Key fiscal indicators of state forestry organizations of MD SR and forestry schools^{***}

No.	Indicator	Unit	Factual figures				Estimate for 2007	Outlook for 2008
			1990	2004	2005	2006		
1	Earnings and revenue	million SKK	352	840	1 008	975	856	762
2	Timber earnings		303	518	614	530	513	521
3	Other earnings and receipts		36	265	384	432	333	228
4	Direct costs of silvicultural operations		54	53	46	61	63	62
5	Direct costs of felling operations		309	179	187	201	187	192
6	Total costs of silvicultural operations			63	71	66	68	69
7	Total costs of felling operations			202	208	226	202	210
8	Total production costs		310	811	858	887	835	735
9	Material costs including depreciation		123	168	173	162	133	136
10	Depreciation		39	67	80	84	77	78
11	Personnel costs		128	265	205	201	200	210
12	– labour costs		93	172	138	140	139	145
13	Economic result (profit, loss)		42	29	150	88	21	27
14	Total state subsidies		14	57	61	69	49	50
15	– state subsidies for forestry operations		13	10	10	13	10	13
16	– state investment subsidies		1	0	3	9	10	
17	– state subsidies for other activities			47	48	47	29	30
18	Overdue assets		0	86	85	71	43	21
19	Overdue obligations by December 31		0	0	0	19	0	0

Source: PFI 2007, Green Reports, special questionnaire from forest owners and tenurers, analytical standards of state forest enterprises, sectoral statistical record Les V (MA SR) 5-01, Les F (MA SR) 7-01, Les V (MA SR) 1-04, Les D (MA SR) 2-04, Les P (MA SR) 6-01, Uč POD 1-01, Uč POD 2-01,

Note: ^{***}before 2004 published as “Key fiscal indicators of state forestry organizations outside MA SR”

Table 4 Key economic indicators of state forestry organizations of MD SR and forestry schools^{***}

No.	Indicator	Unit	Factual figures				Estimate for 2007	Outlook for 2008
			1990	2004	2005	2006		
1	Σ forest regeneration	ha	1 467	798	877	822	850	800
2	– artificial regeneration		1 192	680	658	632	600	550
3	Treatment of young forest stands		2 884	132	84	514	300	250
4	Protection of young forest stands		5 700	2 405	2 910	2 866	2 800	2 700
5	Forest protection (direct costs)	thousand SKK	54 000	2 245	2 578	1 986	2 000	2 100
6	Cleaning	ha	3 368	1 915	2 133	1 962	1 900	1 950
7	Thinning		1 759	2 613	2 251	2 505	2 550	2 600
8	Σ timber felling	thousand m ³	476	386	382	381	380	375
9	– conifer		276	204	213	209	200	200
10	– broadleaf		200	182	169	172	180	175
11	Σ incidental felling (from line 8)		196	115	122	138	130	110
12	– conifer		154	103	110	110	100	90
13	– broadleaf		42	12	12	28	30	20
14	Σ timber purchase		0	5	0	0	0	0

Table 4 – contd.

No.	Indicator	Unit	Factual figures				Estimate for 2007	Outlook for 2008
			1990	2004	2005	2006		
15	– conifer	thousand m ³	0	2	0	0	0	0
16	– broadleaf		0	3	0	0	0	0
17	Σ timber sale		338	390	487	382	380	370
18	– conifer		233	206	242	211	210	210
19	– broadleaf		105	184	245	171	170	170
20	Stumpage sale (from line 17)		0	12	8	16	20	20
21	– conifer		0	8	6	14	15	15
22	– broadleaf		0	4	2	2	5	5
23	Σ domestic timber sale		322	364	464	364	360	350
24	– conifer		224	186	225	198	200	200
25	– broadleaf		98	178	239	166	160	150
26	Timber export (from line 17) ^{*)}		16	26	22	18	20	20
27	– conifer		9	20	16	14	10	10
28	– broadleaf		7	6	6	4	10	10
29	Σ investments	million SKK	12	61	192	221	100	90
30	Construction works		5	40	120	119	50	40
31	Machinery & equipment		7	21	62	49	45	40
32	Other ^{**)}				10	53	5	10
33	Forest road network (December 31)	km	1 875	979	975	950	945	940
34	Unpaved forest roads (December 31)		1 463	708	708	705	700	695
35	Length of managed watercourses		682	692	692	692	692	692
36	Area of managed forest properties	thousand ha	147	86	84	84	84	83
37	Economic staff	persons	2 623	894	624	569	550	540
38	– workers		1 836	560	337	296	280	275
39	Average monthly earnings	SKK	2 944	15 732	18 928	21 096	22 079	23 255

Source: PFI 2007, Green Reports, special questionnaire from forest owners and tenurers, analytical standards of state forest enterprises, sectoral statistical record Les V (MA SR) 5-01, Les F (MA SR) 7-01, Les V (MA SR) 1-04, Les D (MA SR) 2-04, Les P (MA SR) 6-01, Uč POD 1-01, Uč POD 2-01

Note: ^{*)}exports realized on behalf of forest owners/tenurers, ^{**)e.g.}FMP elaboration, other intangibles, ^{***)}before 2004 published as "Key fiscal indicators of state forestry organizations outside MA SR"

Table 5 Summary key fiscal indicators of state forestry organizations

No.	Indicator	Unit	Factual figures				Estimate for 2007	Outlook for 2008
			1990	2004	2005	2006		
1	Earnings and revenue	million SKK	4 531	7 423	9 708	9 212	7 780	7 698
2	Timber earnings		2 604	5 768	7 635	6 502	5 910	6 113
3	Other earnings and receipts		920	1 501	2 059	2 697	1 860	1 572
4	Direct costs of silvicultural operations		565	639	874	941	827	841
5	Direct costs of felling operations	million SKK	916	2 712	3 953	3 613	3 497	3 555
6	Total costs of silvicultural operations		776	877	1 137	1 220	1 072	1 093
7	Total costs of felling operations		970	3 637	4 752	4 559	4 376	4 453
8	Total production costs		4 326	6 932	9 341	8 714	7 706	7 619
9	Material costs including depreciation		1 976	3 380	3 649	4 166	3 953	4 005
10	Depreciation		596	445	474	489	504	506
11	Personnel costs		2 056	2 469	2 841	2 280	2 441	2 552
12	– labour costs		1 490	1 764	2 048	1 631	1 752	1 829
13	Economic result (profit, loss)		205	491	367	498	74	79
14	Total state subsidies		1 115	180	172	125	153	186
15	– state subsidies for forestry operations		1 007	16	14	13	10	13
16	– state investment subsidies		1	26	30	9	30	50
17	– state subsidies for other activities		107	138	128	103	113	126
18	Overdue assets		105	103	626	550	497	445
19	Overdue obligations by December 31		10	26	17	31	2	1

Source: PFI 2007, Green Reports, special questionnaire from forest owners and tenurers, analytical standards of state forest enterprises, sectoral statistical record Les V (MA SR) 5-01, Les F (MA SR) 7-01, Les V (MA SR) 1-04, Les D (MA SR) 2-04, Les P (MA SR) 6-01, Uč POD 1-01, Uč POD 2-01

Table 6 Summary key economic indicators of state forestry organizations

No.	Indicator	Unit	Factual figures				Estimate for 2007	Outlook for 2008
			1990	2004	2005	2006		
1	Σ forest regeneration	ha	18 964	8 746	8 059	9 419	9 000	8 800
2	– artificial regeneration		15 500	5 275	5 255	5 185	4 800	4 500
3	Treatment of young forest stands		16 968	7 508	8 018	8 151	8 300	8 000
4	Protection of young forest stands		141 920	36 466	36 463	37 528	37 500	37 000
5	Forest protection (direct costs)	thousand SKK	95 000	66 531	90 825	134 457	138 500	130 000
6	Cleaning	ha	34 143	20 294	19 564	19 634	18 500	18 300
7	Thinning		37 143	34 203	27 256	28 993	29 500	30 200
8	Σ timber felling	thousand m ³	5 276	4 308	6 507	4 767	4 300	4 200

Table 6 – contd.

No.	Indicator	Unit	Factual figures				Estimate for 2007	Outlook for 2008
			1990	2004	2005	2006		
9	– conifer	thousand m ³	2 777	2 182	4 435	2 774	2 300	2 200
10	– broadleaf		2 499	2 126	2 072	1 993	2 000	2 000
11	Σ incidental felling (from line 8)		2 611	1 599	4 356	2 362	1 700	1 600
12	– conifer		1 726	1 384	4 115	2 095	1 400	1 300
13	– broadleaf		885	215	241	267	300	300
14	Σ timber purchase		49	15	5 003	12	10	10
15	– conifer		30	7	4 995	5	5	6
16	– broadleaf		19	8	8	7	5	4
17	Σ timber sale		5 070	4 345	6 194	4 511	3 990	3 900
18	– conifer		2 723	2 271	4 127	2 542	2 190	2 150
19	– broadleaf		2 347	2 074	2 067	1 969	1 800	1 750
20	Stumpage sale (from line 17)		60	29	683	47	50	40
21	– conifer		25	21	678	22	30	30
22	– broadleaf		35	8	5	25	20	10
23	Σ domestic timber sale		4 720	3 939	5 616	4 303	3 840	3 750
24	– conifer		2 531	2 071	3 684	2 480	2 140	2 100
25	– broadleaf		2 189	1 868	1 932	1 823	1 700	1 650
26	Timber export (from line 17) ^{*)}		350	406	577	208	150	150
27	– conifer		192	200	442	63	50	50
28	– broadleaf		158	206	135	145	100	100
29	Σ investments	million SKK	553	372	807	1 024	900	800
30	Construction works		279	170	363	465	450	400
31	Machinery & equipment		274	195	387	502	400	350
32	Other ^{**)}		0	7	57	57	50	50
33	Forest road network (December 31)	km	20 547	9 942	9 945	9 947	9 948	9 949
34	Unpaved forest roads (December 31)		14 937	7 680	7 682	7 684	7 686	7 688
35	Length of managed watercourses		23 640	19 159	18 559	18 746	18 746	18 740
36	Area of managed forest properties	thousand ha	1 976	1 191	1 174	1 123	1 110	1 099
37	Economic staff	persons	36 316	8 288	6 836	5 913	5 913	5 840
38	– workers		25 536	4 663	3 406	2 605	2 573	2 520
39	Average monthly earnings	SKK	3 419	16 857	19 040	22 669	24 543	26 113

Source: PFI 2007, Green Reports, special questionnaire from forest owners and tenurers, analytical standards of state forest enterprises, sectoral statistical record Les V (MA SR) 5-01, Les F (MA SR) 7-01, Les V (MA SR) 1-04, Les D (MA SR) 2-04, Les P (MA SR) 6-01, Uč POD 1-01, Uč POD 2-01

Note: ^{*)}exports realized on behalf of forest owners/tenurers, ^{**)e.g.}FMP elaboration, other intangibles

Table 7 Key fiscal indicators in non-state forests

No.	Indicator	Unit	Factual figures				Estimate for 2007	Outlook for 2008
			1990	2004	2005	2006		
1	Earnings and revenue	million SKK	1 288	4 061	4 071	4 927	4 470	4 590
2	Timber earnings		990	3 700	3 720	4 478	4 000	4 100
3	Other earnings and receipts		187	350	340	340	370	370
4	Direct costs of silvicultural operations		245	608	602	720	760	770
5	Direct costs of felling operations		423	1 562	1 750	1 780	1 700	1 750
6	Total costs of silvicultural operations		318	848	753	990	990	1 000
7	Total costs of felling operations		614	2 290	2 411	2 520	2 300	2 350
8	Total production costs		1 258	3 700	3 720	3 950	3 700	3 750
9	Material costs including depreciation		353	1 480	1 490	1 450	1 500	1 550
10	Depreciation		109	375	360	350	360	380
11	Personnel costs		546	1 209	1 334	1 380	1 270	1 280
12	– labour costs		396	876	937	1 018	891	898
13	Economic result (profit, loss)		30	361	351	977	770	840
14	Total state subsidies		111	45	26	221	200	230
15	– state subsidies for forestry operations		111	11	11	109	100	120
16	– state investment subsidies		—	34	15	75	80	90
17	– state subsidies for other activities		—	—	—	37	20	20
18	Overdue assets		296	150	120	130	120	110
19	Overdue obligations by December 31		123	50	50	40	30	40

Source: PFI 2007, Green Reports, special questionnaire from forest owners and tenurers, sectoral statistical record Les V (MA SR) 5-01, Les F (MA SR) 7-01, Les V (MA SR) 1-04, Les D (MA SR) 2-04, Les P (MA SR) 6-01, U&POD 1-01, U&POD 2-01,

Note: Since 2003, the production costs cover also incurred labour costs of forest owners and tenurers and their family members

Table 8 Key economic indicators in non-state forests

No.	Indicator	Unit	Factual figures				Estimate for 2007	Outlook for 2008
			1990	2004	2005	2006		
1	Σ forest regeneration	ha	1 924	5 214	5 445	6 142	6 200	6 200
2	– artificial regeneration		1 766	3 591	3 667	4 071	4 000	4 000
3	Treatment of young forest stands	thousand SKK	870	3 277	3 364	3 197	3 200	3 100
4	Protection of young forest stands		12 295	30 200	29 252	30 829	31 000	31 500
5	Forest protection (direct costs)		41 000	45 298	46 070	55 800	50 000	48 000
6	Cleaning	ha	5 480	10 021	9 514	8 749	9 000	9 100
7	Thinning		7 145	21 779	18 816	17 573	18 000	18 500

Table 8 – contd.

No.	Indicator	Unit	Factual figures				Estimate for 2007	Outlook for 2008
			1990	2004	2005	2006		
8	Σ timber felling	thousand m ³	966	2 964	3 683	3 590	3 200	3 100
9	– conifer		491	1 821	2 492	2 376	2 000	2 000
10	– broadleaf		475	1 143	1 191	1 214	1 200	1 100
11	Σ incidental felling (from line 8)		409	1 317	2 177	1 904	1 700	1 600
12	– conifer		358	1 171	2 038	1 736	1 500	1 400
13	– broadleaf		51	146	139	168	200	200
14	Σ timber purchase		0	120	160	150	200	250
15	– conifer		0	50	70	70	100	150
16	– broadleaf		0	70	90	80	100	100
17	Σ timber sale		929	2 853	3 093	3 283	3 000	2 900
18	– conifer		484	1 745	2 102	2 222	2 000	2 000
19	– broadleaf		445	1 108	991	1 061	1 000	900
20	Stumpage sale (from line 17)		100	68	100	371	400	350
21	– conifer		65	50	70	286	300	250
22	– broadleaf		35	18	30	85	100	100
23	Σ domestic timber sale		802	2 656	2 889	3 106	2 800	2 700
24	– conifer		394	1 631	1 926	2 070	1 850	1 800
25	– broadleaf		408	1 025	963	1 036	950	900
26	Timber export (from line 17) ^{*)}		127	197	204	177	200	200
27	– conifer		90	114	177	152	150	150
28	– broadleaf		37	83	27	25	50	50
29	Σ investments	million SKK	71	142	125	150	160	150
30	Construction works		51	50	40	55	60	60
31	Machinery & equipment		20	80	75	75	90	80
32	Other ^{**)}		—	12	10	20	10	10
33	Forest road network (December 31)	km	7 249	11 247	11 248	11 249	11 250	11 251
34	Unpaved forest roads (December 31)		3 108	8 207	8 209	8 210	8 211	8 212
35	Length of managed watercourses		0	0	0	0	0	0
36	Area of managed forest properties	thousand ha	430	815	832	884	897	908
37	Economic staff	persons	5 900	6 580	6 560	6 550	6 540	6 540
38	– workers		4 350	4 860	4 840	4 830	4 820	4 820
39	Average monthly earnings	SKK	5 600	11 100	11 900	12 324	12 900	13 500

Source: PFI 2007, Green Reports, special questionnaire from forest owners and tenurers, sectoral statistical record Les V (MA SR) 5-01, Les F (MA SR) 7-01, Les V (MA SR) 1-04, Les D (MA SR) 2-04, Les P (MA SR) 6-01, Uč POD 1-01, Uč POD 2-01,

Note: ^{*)}exports realized on behalf of forest owners/tenurers, ^{**)e.g.}FMP elaboration, other intangibles

Table 9 Key fiscal indicators for the entire sector

No.	Indicator	Unit	Factual figures				Estimate for 2007	Outlook for 2008
			1990	2004	2005	2006		
1	Earnings and revenue	million SKK	4 531	11 484	13 779	14 139	12 250	12 288
2	Timber earnings		2 604	9 468	11 355	10 980	9 910	10 213
3	Other earnings and receipts		920	1 851	2 399	3 037	2 230	1 942
4	Direct costs of silvicultural operations		565	1 247	1 476	1 661	1 587	1 611
5	Direct costs of felling operations		916	4 274	5 703	5 393	5 197	5 305
6	Total costs of silvicultural operations		1 094	1 725	1 890	2 210	2 062	2 093
7	Total costs of felling operations		1 584	5 927	7 163	7 079	6 676	6 803
8	Total production costs		4 326	10 632	13 061	12 664	11 406	11 369
9	Material costs including depreciation		1 976	4 860	5 139	5 616	5 453	5 555
10	Depreciation		596	820	834	839	864	886
11	Personnel costs		2 056	3 678	4 175	3 660	3 711	3 832
12	– labour costs		1 490	2 640	2 985	2 649	2 643	2 727
13	Economic result (profit, loss)		205	852	718	1 475	844	919
14	Total state subsidies		1 222	225	198	346	353	416
15	– state subsidies for forestry operations		1 007	27	25	122	110	133
16	– state investment subsidies		108	60	45	84	110	140
17	– state subsidies for other activities		107	144	128	140	133	146
18	Overdue assets		105	253	746	680	617	555
19	Overdue obligations by December 31		10	76	67	71	32	41

Source: PFI 2007, Green Reports, special questionnaire from forest owners and tenurers, analytical standards of state forest enterprises, sectoral statistical record Les V (MA SR) 5-01, Les F (MA SR) 7-01, Les V (MA SR) 1-04, Les D (MA SR) 2-04, Les P (MA SR) 6-01, Uč POD 1-01, Uč POD 2-01,

Table 10 Key economic indicators for the entire forest sector

No.	Indicator	Unit	Factual figures				Estimate for 2007	Outlook for 2008
			1990	2004	2005	2006		
1	Σ forest regeneration	ha	18 964	13 960	13 504	15 561	15 200	15 000
2	– artificial regeneration		15 500	8 866	8 922	9 256	8 800	8 500
3	Treatment of young forest stands		16 968	10 785	11 382	11 348	11 500	11 100
4	Protection of young forest stands		141 920	66 666	65 715	68 357	68 500	68 500
5	Forest protection (direct costs)	thousand SKK	95 000	111 829	136 895	190 257	188 500	178 000
6	Cleaning	ha	34 143	30 315	29 078	28 383	27 500	27 400
7	Thinning		37 143	55 982	46 072	46 566	47 500	48 700

Table 10 – contd.

No.	Indicator	Unit	Factual figures				Estimate for 2007	Outlook for 2008
			1990	2004	2005	2006		
8	Σ timber felling	thousand m ³	5 276	7 268	10 190	8 357	7 500	7 300
9	– conifer		2 777	4 000	6 927	5 150	4 300	4 200
10	– broadleaf		2 499	3 268	3 263	3 207	3 200	3 100
11	Σ incidental felling (from line 8)		2 611	2 916	6 533	4 266	3 400	3 200
12	– conifer		1 726	2 555	6 153	3 831	2 900	2 700
13	– broadleaf		885	361	380	435	500	500
14	Σ timber purchase		49	135	5 163	162	210	260
15	– conifer		30	57	5 065	75	105	156
16	– broadleaf		19	78	98	87	105	104
17	Σ timber sale		5 070	7 198	9 287	7 794	6 990	6 800
18	– conifer		2 723	4 016	6 229	4 764	4 190	4 150
19	– broadleaf		2 347	3 182	3 058	3 030	2 800	2 650
20	Stumpage sale (from line 17)		60	97	783	418	450	390
21	– conifer		25	71	748	308	330	280
22	– broadleaf		35	26	35	110	120	110
23	Σ domestic timber sale		4 720	6 595	8 505	7 409	6 640	6 450
24	– conifer		2 531	3 702	5 610	4 550	3 990	3 900
25	– broadleaf		2 189	2 893	2 895	2 859	2 650	2 550
26	Timber export (from line 17) ⁾		350	603	781	385	350	350
27	– conifer		192	314	619	215	200	200
28	– broadleaf		158	289	162	170	150	150
29	Σ investments	million SKK	553	514	932	1 174	1 060	950
30	Construction works		279	220	403	520	510	460
31	Machinery & equipment		274	275	462	577	490	430
32	Other ^{**)}		—	19	67	77	60	60
33	Forest road network (December 31)	km	20 547	21 189	21 193	21 196	21 198	21 200
34	Unpaved forest roads (December 31)		14 937	15 887	15 891	15 894	15 897	15 900
35	Length of managed watercourses		23 640	19 159	18 746	18 559	18 746	18 740
36	Area of managed forest properties	thousand ha	1 977	2 006	2 006	2 007	2 007	2 007
37	Economic staff	persons	36 316	14 868	13 396	12 463	12 453	12 380
38	– workers		25 536	9 523	8 246	7 435	7 393	7 340
39	Average monthly earnings	SKK	3 419	14 309	15 543	17 232	18 429	19 450

Source: PFI 2007, Green Reports, special questionnaire from forest owners and tenurers, analytical standards of state forest enterprises, sectoral statistical record Les V (MA SR) 5-01, Les F (MA SR) 7-01, Les V (MA SR) 1-04, Les D (MA SR) 2-04, Les P (MA SR) 6-01, Uč POD 1-01, Uč POD 2-01

Note: ⁾exports realized on behalf of forest owners/tenurers, ^{**)e.g.} FMP elaboration, other intangibles

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14.3. Acronyms and abbreviations

ACS	Agricultural Consulting System	IFE SAS	Institute of Forest Ecology of the Slovak Academy of Sciences in Zvolen
AFC	Air Fire Service	IFSA	International Forestry Students' Association
AFSE	Association of Forest Sector Employers	ITEFWMS	Institute for Training and Education of Forestry and Water Management Staff of SR, Zvolen
ANFO	Associations of non-state forest owners	JRC	Joint Research Centre
ARDS	Agency for Research and Development Support	LUR	Land Use Reform
ARD-SOP	Sectoral Operational Programme "Agriculture and Rural Development"	MA SR	Ministry of Agriculture of the Slovak Republic
AS	Approved stands	MCPFE	Ministerial Conferences on the Protection of Forests in Europe
AVZ	Altitudinal vegetation zone	ME SR	Ministry of the Environment of the Slovak Republic
BZ	Buffer zone	MFE SR, s.e.	Military Forests and Estates of the Slovak Republic, state enterprise Pliešovce
CEGA	Cultural and Educational Grant Agency	MI SR	Ministry of Interior of the Slovak Republic
CEN	European Centre for Normalization	NFC	National Forest Centre
CEPF	Confederation of European Forest Owners	NFC-FRI	National Forest Centre – Forest Research Institute
CFE	Centre for Further Education	NFIM	National Forest Inventory and Monitoring
DFO	District Forest Office	NFP	National Forest Programme
EAFRD	European Agricultural Fund for Rural Development	NGO	Non-governmental organization
EAGGF	European Agricultural Guidance and Guarantee Fund	NIML	National Inventory and Forest Monitoring
EFC	European Forestry Commission FAO	NNM	National nature monument
EN	European Norms	NNR	National nature reserve
EU	European Union	NP	National park
EUSTAFOR	European State Forest Association	NR	Nature reserve
FAE Ulič, s.e.	Forests and Estates Ulič, state enterprise	NSPRD	National Strategic Plan of Rural Development
FAO	Food and Agriculture Organization of the United Nations	PFI	Permanent Forest Inventory
FC	Forestry College	PLA	Protected landscape area
FCL	Forest crop land	PMS	Partial Monitoring System Forests
FE	Forest Enterprise	PP	Nature monuments
FF	Faculty of Forestry of TU Zvolen	PPI	Pulp & paper-making industry
FI	Furniture-making industry	PS	Protected sites
FIS	Forestry Information System	RDP	Rural Development Plan
FNT	Forest nature trial	RFO	Regional Forest Office
FP	Forest area (forest plot)	RSM	Research Station and Museum of SF TANAP
FPS	Forest Protection Service	SAFGM	State administration on forestry and game management
FRB	Fire and Rescue Brigade	SCEA	Sectoral Classification of Economic Activities
FRM	Forest reproduction material	SCI	Site of Community Interests
FSDU	Forest spatial division unit	SFCA	Slovak Forest Certification Association
FST	Forest site type	SFTANAP	State Forests of TANAP
FSTMU	Management unit of forest site types	SFMP	Summary Forest Management Plan
FTU	Forest tenure unit	SGA	Scientific and Grant Agency
GAV	Gross added value	SHU	Slovak Hunting Union
GDP	Gross domestic product		
GRF	Gene reserve forests		
HA	Hunting association		
IAESTE	International Association for the Exchange of Students for Technical Experience		
IAF	International Agreement on Forests		
IEEAF	Integrated Environmental and Economic Account for Forests		

SNAS	Slovak National Accreditation Service	TC UNECE	Timber Committee of the United Nations Economic Commission for Europe
SNC	State Nature Conservancy of the Slovak Republic	TCI	Total current increment
SO	Seed orchards	TI	Timber industry
SOP	Sectoral Operational Programme	TU Zvolen	Technical University Zvolen
SPA	Special Protection Area	UNECE	United Nations Economic Commission for Europe
SS	Seed stands	UNESCO	United Nations Educational, Scientific and Cultural Organization
SSPA	Small-scale protected area	UNFF	United Nations Forum on Forests
ST	Plus trees	WPI	wood-processing industry hospodárstva
STN	Slovak Technical Norm		
SUTN	Slovak Institute of Technical Normalization		
TC	Timber Committee		

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