

# Structural Changes of State Forest Management Organisations in Estonia, Latvia, Lithuania, Serbia and Slovakia since 1990

MEELIS TEDER<sup>1\*</sup>, DIANA MIZARAITĒ<sup>2</sup>, STASYS MIZARAS<sup>3</sup>, DRAGAN NONIĆ<sup>3</sup>, JELENA NEDELJKOVIĆ<sup>3</sup>, ZUZANA SARVAŠOVÁ<sup>4,5</sup>, LELDE VILKRISTE<sup>6</sup>, ZINTA ZĀLĪTE<sup>6</sup> AND GERHARD WEISS<sup>7</sup>

<sup>1</sup>*Institute of Forestry and Rural Engineering, Estonian University of Life Sciences, Kreutzwaldi 5, Tartu 51014, Estonia; e-mail: meelis.tdr@gmail.com;*

<sup>2</sup>*Department of Forest Resources, Economics and Policy, Institute of Forestry, Lithuanian Research Centre for Agriculture and Forestry, Liepu-1, Girionys, LT-53101, Kaunas district, Lithuania;*

<sup>3</sup>*University of Belgrade – Faculty of Forestry, Kneza Višeslava 1, 11030, Belgrade, Serbia;*

<sup>4</sup>*National Forest Centre – Forest Research Institute Zvolen, T. G. Masaryka 22. SK-96092, Zvolen, Slovak Republic;*

<sup>5</sup>*Faculty of Forestry and Wood Sciences, Czech University of Life Sciences Prague, Kamycká 129, 16521 Praha 6-Suchbát, Czech Republic;*

<sup>6</sup>*Latvian State Forest Research Institute „Silava”, Rīga-111, Salaspils, LV 2169, Latvia;*

<sup>7</sup>*European Forest Institute – Central-East European Regional Office (EFICEEC) c/o University of Natural Resources and Life Sciences, Vienna (BOKU) Feistmantelstraße 4 A-1180 Vienna, Austria;*

\*Corresponding author

Teder, M., Mizaraitė, D., Mizaras, S., Nonić, D., Nedeljković, J., Sarvašová, Z., Vilkriste, L., Zālīte, Z. and Weiss, G. 2015. Structural Changes of State Forest Management Organisations in Estonia, Latvia, Lithuania, Serbia and Slovakia since 1990. *Baltic Forestry* 21(2): 326–339.

## Abstract

All former socialist countries in central and eastern Europe have been undergoing a transition from one political system (based on a centrally planned economy and a one-party system) to a radically different political system (based on a market economy and a democratic political system). The formation of a free timber market and new modes of ownership have caused a change in the state forest sector as well.

The primary objective of this article is to demonstrate the changes in state forest enterprises over the last 20 years in five selected countries of central and Eastern Europe: Estonia, Latvia, Lithuania, Serbia and Slovakia. Country case descriptions of the situation are based on literature analysis, statistical data and expert opinions.

The main findings of this study are the following: changes in ownership structure caused a reduction of the area managed by state forest management organisations in most case study countries; in all mentioned countries state forest enterprises have undergone changes in their organisational structure; a reduction of personnel in state forest enterprises and an increase in outsourced activities were observed. Methods of timber sales have altered during the last 20 years; in several countries, the state forest management organisations play a role in stabilising the domestic timber market. The importance of forest values, such as environmental protection and forest-related recreation, is also increasing in the state forest sector.

**Key words:** forest ownership, state forest enterprises, organisational changes, central and eastern Europe

## Introduction

All post-communist countries in central and eastern Europe (CEE) have been undergoing a transition from one political system (based on a centrally planned economy and a one-party system) to a radically different political system (based on a market economy and a democratic political system). Several new phenomena have emerged in the forestry systems of these

countries too, such as: privatisation of the forest industry, the formation of a free timber market, increasing timber exports, as well as new modes of ownership (e.g. private forests and communal forests) and enterprises (e.g. private logging companies). All these changes have influenced the state forest sector.

Hare and Huges (1991) have stated that no theories for reforms have been developed regarding state forest enterprises (SFE). Generally, this means privati-

sation, usually in the form of outsourcing, selling or divesting licences. This method is used quite frequently in privatising state property, although some criticism for the approach in CEE countries exists (Hare and Huges 1991). Several approaches can be identified, including reprivatisation, which means restitution or compensation paid to former owners, direct sale of assets either to a single buyer or through an initial public offering of shares), and free distribution (to the whole population, the workforce of particular enterprises, or other institutions). State organisations can also be commercialised, i.e. converted to corporate forms.

Privatisation is an essential first step in the marketisation process. Privatisation has bloated (Yamin 1998) the size of the private sector, and because many state-owned enterprises were small and medium-sized enterprises (SMEs), it is considerably increased the number of SMEs in the private sector. Assaf (1998) notes that privatisation is a major instrument of the transformation because it develops SMEs in the former European communistic countries.

The knowledge about discrepancies in the path and policies of economic transition can support private sector development in countries expecting to undergo privatisation processes. CEE countries are known to use the "shock therapy" approach and the East Asian "gradualism" approach (e.g. Marangos 2003, Dehejia 2003 and Katz 1995). Katz (1995) describes the CEE "shock therapy" approach as either the shift of economic decision-making to the private sector and the exclusion of government intervention in the national economy, or private enterprises operating in a framework of market-determined prices, but abolishing the need for public sector involvement on the macro-level in a national economy. In early discussions between shock-therapists and gradualists, the speed of transitions was in the centre of the debate; however Popov (2000) argued that the strength of the new institutions is more important than the speed of the process.

The privatisation of state-owned companies can be carried out in different ways. Several voices prefer SMEs as alternatives to former state owned enterprises, while highlighting the need for an even distribution of large, medium, and small enterprises (Alam et al. 2009, McIntyre 2001). As an alternative to complete privatisation commercialising company functions has been found an option. Some positive examples have shown that commercialising can be instrumental to give hold to corruption that is frequently associated with privatisation processes (Alam et al. 2009).

Many successful SMEs in CEE are in fact not new, but are often spin-offs of pre-existing state-owned companies, cooperatives or transnational companies (Dallago 2003). Similarly, Klapper et al. (2002) have

noted that many present-day companies are the result of restructuring and downsizing large firms, privatisation, or outsourcing of support services and vertical fragmentation of products.

If a centrally planned economy is transformed to a market-oriented economy, the reduction of government ownership in business is a necessary condition. However, a smaller or weaker public sector may also hamper private sector growth, as experienced by some CEE countries, when they kept private enterprises operating in a framework of market-determined prices, but eradicated the public sector involvement (Katz 1995).

Regardless of the political and cultural context, in the early stage of the economic transition process, when institutional support and market conditions are not apparent, the state and public sectors play key roles in determining the success of establishing the private sector (Dallago 2003). In this sense, strategies to restructure the often inefficient state-owned companies to better meet the requirements of a global world are an essential part of privatisation.

The forestry sector plays an important economic and environmental role in Baltic countries (Estonia, Latvia and Lithuania) and in other selected eastern European countries (Serbia and Slovakia). The domination of state forest ownership, state capital goods and centralised planned management characterised these countries until 1990. A reduction in state forest areas and the development of market relations influenced the state forestry transformation after 1990. This resulted in the restructuring of state forest management organisations (SFMO).

Earlier studies covering the target countries and forestry related organisations' development have mainly focused on private forestry and its organisations (e.g. Weiss et al. 2012), or focus on SFMO development in a single country (e.g. Larsen and Brukas 2000, Deltuvas et al. 2006, Dudutis and Lazdinis 2008). Nordberg (2007) examined the reforms of state forest management in three post-Soviet republics, among them only Latvia is in the scope of this study. The present article concentrates on the organisational structure and changes in SFMO (e.g. type and number of enterprises), and on changes in the implementation of forestry activities and functions fulfilled by SFMO. The primary objective of this study is to identify the major changes in state forest enterprises and their altered functionalities over the last 20 years in the five selected central and eastern European countries.

## Materials and Methods

The current study uses the definition by EUSTA-FOR (2014) that the state forest management organi-

sation (SFMO) is a commercially oriented, state-owned forest company, enterprise or agency, which executes sustainable forest management and wood production as its major concern. In all observed countries, the term “state forest enterprise” was mainly used under socialism prior to the large changes at the beginning of the 1990s. To describe the situation in 2010, the abbreviation SFE for a state forest enterprise is only used in cases, when this term is actively used in a specific country.

The analysis covers Estonia, Latvia, Lithuania, Serbia, and Slovakia, which have similar forest resources: a forest area of approximately 2-3 million ha and forest cover between 31 and 54%. The growing stock is between 400-600 million m<sup>3</sup>. The coniferous forests are dominating in the Baltic countries, whereas in Slovakia and especially in Serbia broadleaved species are dominating (Table 1).

**Table 1.** Statistical forestry data of the countries studied (2010)

Country	Forest		Growing stock			Fellings	
	×1000 ha	% of land area	million m <sup>3</sup>	m <sup>3</sup> /ha	Coniferous %	×1000 m <sup>3</sup>	m <sup>3</sup> /ha
Estonia	2203	52	441	200	55	5714	2.8
Latvia	3354	54	633	179	53	12421	4.0
Lithuania	2165	35	479	221	57	8600	4.6
Serbia	2713	31	415	153	12	2696*	1.2*
Slovakia	1938	40	514	265	45	10418	5.9

Source: MCPFE 2011, \*SORS 2011

The analysed countries have developed legal forest policy frameworks: the forest law and the national forest programmes. All selected countries started revising their forest management related legislation after the collapse of the socialist camp and during the political changes in the early 1990s; the exception is Serbia, where the revision started only in 2000.

To describe the situation regarding state forest enterprise restructuring on a national level, a combination of two methods was applied: a country case description based on (i) literature analysis and (ii) expert knowledge and questionnaire survey. The study is based on the hypothesis that state forest enterprises have been reorganised. The reorganisation of SFMOs includes a new organisational structure, a change in legal status, rational restructuring of labour force (reducing the number of employees), and a change in forest management activities.

The restructuring of SFEs in each country was analysed according to changes of several topics in 1990 and in 2010: managed forest area, number of enterprises, type of SFMO, felling intensity, outsourcing and types of forestry operations, persons employed, method of timber sales, relations with the private forest sector, major services delegated to SFMO and nature protected areas.

**Country case studies**

**Estonia.** The big changes resulting from restructuring the state forest management system had been discussed already at the end of the socialist period, from 1988 to 1990, as a part of the programme of self-sufficient Estonia (Etverk 2005). The first big reforms in the state forestry started on March 01, 1992, when forest management (state forest districts) was separated from the industrial parts of SFEs, which were later privatised. As a result of these reforms, 186 legally independent state forest districts were established under the supervision of the National Forestry Board. During the years 1995–1997, the Estonian Forestry Development Program (EFDP) was carried out with technical assistance by the Government of Finland (Kallas 2002). EFDP partly prepared new ideas and structures for the next changes in Estonian state forest management. In 1997, the number of state forest

districts was reduced by 71 by merging the districts, while some districts had been merged already in 1993 – 1996. Finally, on 01 January 1998 in Estonia there were 102 state forest districts.

The new version of the Estonian Forest Act in December 1998 created a legal base for the new structure of state forest management. The act was a legal base for the establishment of the profit-making state agency, the State Forest Management Centre (in Estonian *Riigimetsa Majandamise Keskus* hereafter referred to as RMK). Following the Forest Act (1998), among other tasks, the RMK has to generate income and transfer revenues to the state budget. In addition to sales of wood to timber industries in an amount that ensures the balanced incomes to state budget from woodworking industries, the RMK holds mechanisms to apply, which stabilise the timber market. The RMK started operations in January 1999, after which the majority (except for mainly educational forests) of the state forest management was centralised into one legal entity. By its legal status the RMK is a profit making state agency, the only legal entity of that kind in Estonia. At the end of the second year of RMK activities the number of forest districts decreased to 77 and their work was organised in 5 regions. By the beginning of 2008 the number of forest districts was decreased to 63. When RMK started to operate at the

beginning of 1999, the total staff was 2,280, gradually shrinking to 1,658 in 2001, 1,179 in January 2006, and 1,118 employees at the beginning of 2008.

The structural reform in state forest management was carried out in 2008, when on 1 July a functional management scheme replaced the previous territory-based management. Under the territory-based management the local forester was responsible for all activities in his forest district, but the new functional management scheme has created a very narrow specialisation of forestry specialists. Following this scheme, in the same forest area different forestry specialists are responsible for different activities, but their management territory is considerably larger than before. After the reform the RMK forest administration is performed in 17 forest administration districts, and forest management activities are carried out in three regions. After the reform in 2008, the number of staff decreased to 836 at the beginning of 2009. At the end of 2010, 851 employees (454 foresters and other specialists, 345 workers, 52 directors and other administrative officers) worked in the RMK. In addition to direct employment, the RMK estimated that the total number of people employed in the state forest sector was 4,000 including outsourced personnel (RMK 2011).

RMK operating areas are: forest administration, forest management, timber marketing, preservation of the natural environment and recreation management, seed and plant management. The RMK has to earn income for the state by logging and selling wood material. Apart from that, the RMK has tasks that do generate direct economic income, but are to bring benefits for the whole country: maintaining the unique forest nature, nature friendly forest works, offering free recreation possibilities. In 2011, the RMK quit dealing with hunting services; suitable hunting areas are rented out by means of public auctions to hunting organisations.

In 1988, different nature protection categories in the forests of the 1st group covered 28.1% of total forest land, while in SFE forests their share was 30.1% (MNFC 1988). In 2010, the state forests under the RMK management were divided as follows: managed forests (commercial forests) comprise 63.7%, forests with economic limitations (corresponding to protection forests) comprise 19.7% and strictly protected forests constitute 16.6% (RMK 2011).

Until 1990, harvesting operations in final cutting were mostly performed on stumpage basis by another type of forest harvesting enterprises. The SFEs carried out mostly thinning operations, and to minor extent final fellings. In 2010, about 90% of wood harvest operations in the RMK forests were performed by contractors. The RMK is responsible for delivery

of roundwood to buyer yards, while the lorry transport is outsourced. In 2010, the RMK sold 2.87 million m<sup>3</sup> of timber products, out of which 90% was sold as roundwood assortments and only 1% as stumpage (sanitary fellings for firewood and for local people). The rest (9%) was mostly sold as forest chips and a small amount as forest residuals (RMK 2011, Yearbook Forest 2010). Until 1990, afforestation, reforestation and forest protection was performed by SFEs. In 2010, half of these activities were done by the RMK, while the other half was outsourced.

**Latvia.** At the end of the socialist period, 24 SFEs, Gaujas National Park, 2 Nature reserves, Kalsnava Forest Research Station and Ogre Training Centre were managing the state forests (Saliņš 1999). In 1988, the SFEs managed 1,745 thousands ha or 63.3% of forest area, agricultural enterprises (collective farms) managed 916 thousands ha and other forests covered 96 thousands ha. At the end of 1988, there were 637 forestry specialists in agricultural enterprises and 2,414 in the SFEs (Grišāns 1990). The felling quantity in the state forests was 3.8 million m<sup>3</sup> in 1989. There were 43 sawmills and 31 carpentries or other timber processing units under the SFEs (Kronītis 1991). In 1990, the total felling amount in Latvia reached 5.0 million m<sup>3</sup> (Saliņš 1999).

In 1990, supervision, control, planting and road constructions were separated from the SFEs. The Forest Ministry was established, and 34 forest regions with 250 local units and 1,800 districts of forest rangers were initiated (Saliņš 1999). In 1993, the Forest Ministry was reorganised to the State Forest Service (SFS). In 1995, 32 forest regions, Gaujas National Park and training, education and research institutions were under the SFS.

At the beginning of 1990s, most of the SFEs were closed due the bankruptcy; only about 7 to 9 of them kept their positions in the market. During 1993 – 1996 most of the previous SFEs were privatised and forest harvesting became a private business. Long term logging contracts (LTLC) for 10 to 20 years were facilitated by the state to support stable deliveries to industries (state order was 50% from harvesting volume). In 1993, about 46% of harvesting volume was sold through LTLC, 5% in auctions and 49% to municipalities for social needs, forest regions and other consumers. In 1998, the same figures changed to 63%, 27% and 10%. In 1997, there were about 900 harvesting enterprises and 320 of them had LTLCs. The system of LTLCs ended in 1998, but 327 LTLCs were still in force under the new system in 2000 (Saliņš 1999).

In 1998, the forest policy of Latvia was approved. The Latvia–FAO Project “Optimization of state administration system of the Latvian forest sector” (1998–

2000) prepared a conception for reforms of state administration and policy implementation. Based on this project the administration and management of the state forest sector was reorganised and the new system entered into force in 2000.

The Latvian Ministry of Agriculture is responsible for the development of forest policies and legislation. The SFS controls and supervises forest management practices in all ownership types. It also carries out fire protection and maintains a forest register. A new commercial structure, the state-owned joint stock company “*Latvijas valsts meži*” (Latvian state forests, further as LVM) was established in October 1999 by the order of Latvian Government to ensure effective management of state owned forests. The Latvian State, represented by the Ministry of Agriculture, is the shareholder of the LVM. After the reorganisation in 2000, there were 26 forest regions under the SFS with 1,600 employees and the LVM with around 500 employees (DFSL 2001).

The LVM provides sustainable management of state forests and runs tree nurseries to produce seeds and plants, but also deals with hunting, fishing, recreation and tourism, and supports education and research.

In 2010, 1.63 million ha of land was under the management of the LVM, from which 1.59 million ha was forest land (1.4 million ha forest) (LVM 2011a). In accordance with the accepted strategy, nature protection is the main target in 21% of the total area managed by the LVM. 5% from the total land area are managed for recreation and nature education, while 74% of the total area are designated for timber production (LVM 2011a).

In 2000, the LVM sold 3.72 million m<sup>3</sup> of timber (2.9 from final fellings). In accordance with the “Sale Concept for Growing Trees in 2001 – 2003” 67% of timber were sold under the provisions of LTLC and 33% were sold in auctions of felling areas. The income from the sales of growing trees made 91.5% of the total income, while the rest was generated from renting the hunting areas, sales of seeds and plants etc. (LVM 2001). Selling of roundwood in auctions started in 2003. All activities are based on open tenders for roundwood delivery, harvesting and transport services. Since 2003, the share of roundwood assortments has been increasing every year reaching 69% in 2010 (LVM 2011b).

The allowable cut for a 5-year period for the LVM is approved by the Latvian Government. For 2001 – 2005 the allowable cut comprised 15.6 million m<sup>3</sup>, for 2006 – 2010 it was increased to 20.5 million m<sup>3</sup>. During the economic crisis in 2008, the sales from private forests decreased. As the forest sector has an important role in the Latvian economy, the allowable cut was extended by the government up to 24.5 million m<sup>3</sup>

during the economic crisis in order to stabilise the national economy and to support the national wood-working industries and rural employment with the consequence that the LVM was cutting more than on average before. Whilst before 2007 the felling amount per year did not exceed 5 million m<sup>3</sup>, in 2008 it was 5.5 million m<sup>3</sup>, in 2009 and 2010 it was around 7.7 million m<sup>3</sup>. After the crisis, the volume of felling decreased to 6.7 million m<sup>3</sup> in 2011 (LSFS 2013)

**Lithuania.** From the years 1957 to 1992 several structural reforms have been implemented in the forestry sector. In 1987 Lithuanian forests were managed by 10 forest enterprise associations, four state forest enterprises and 10 forest industry companies. One year later in 1988 this was organised by 8 forest enterprise associations, 20 state forest enterprises, 15 forest industry companies, one national park and one experimental station. Later, enterprise associations were reorganized to state forest enterprises while forest industry companies abolished (LRAM 2003). Before the restoration of independency (1990) about 31.8% of total forests area were managed by agricultural enterprises. According to data of state forest inventory in 1988 the forest enterprises and the national park managed 1490.9 thousand ha or 68.2% of forest land (LRAM 2003). After the structural reforms, 43 SFEs and 4 national parks were established. In 1992 the protection and the limited management of forests by agricultural enterprises was delegated to the newly reformed SFEs. The structure of forest ownership had changed due to an ongoing land reform process. In Lithuania, the land reform and restitution started in 1991 and further influenced the development of SFEs activities.

In 1996 the Directorate General of State Forests at the Ministry of Environment was established. This institution was designated as a coordinator of the activities of SFEs. The Directorate General of State Forests establishes the mandatory norms for forest enterprises regarding reforestation, protection and management of forests; organises and co-ordinates the application of advanced technologies in reforestation, protection, improvement and utilisation of forests and forest resources. In 2000 the number of SFEs was reduced from 43 to 42 and the management of forests areas in three national parks was delegated to SFEs. The activities of state enterprises are regulated by the Law on State and Municipal Enterprise, the Law on Forests and other legal acts and regulations.

The number of persons employed in the forest enterprises was reduced from 14.6 thousand (1990) to 9.6 thousand (2010) (LRAM 2003, LSYF 2011). This reduction was applied in all personnel categories and can be assigned to several reasons: 1) the significant

share of forestry works (reforestation, forest maintenance, felling etc.) was transferred to contractors; 2) sawmills of SFEs were sold to the private sector; 3) the managed forest area decreased due to the restitution to former private forest owners; 4) hunting activities were transferred to other organisations, and pine resin collection was eliminated in state forests; 5) new technologies or machinery were less labour-intensive.

In 1990, all forestry work was performed by SFEs. In 2010 forest logging, reforestation and afforestation were mainly implemented by contractors: felling of trees amounted 93%, timber extraction amounted 65%, and timber transport amounted 68%. The intensity of forest utilisation increased from 2.3 m<sup>3</sup> per ha (1990) to 3.5 m<sup>3</sup> per ha (2010).

In 2010 only 8% of wood were sold on stump with the main part as roundwood. In 2013 the electronic auction system of roundwood sales started to operate in Lithuania. This system ensures transparency of roundwood sales in state forest sector and attracts larger timber buyers, who can pay higher prices.

Since 1995 Lithuanian forests have been divided into 4 functional groups: I – forests of strict nature reserves, II – special purpose forests – ecosystem preservation and recreation, III – protective forests, and IV – commercial forests. Nowadays (2010), 28.7% of state forest area are nature protected forests. In 2010, the forests under SFE management were distributed as follows: strict nature reserves (group I) comprised 2.5%, special purpose forests (group II) constituted 15.0%, protective (group III) amounted 11.3%, and commercial forests totalled 71.3% (LSYF 2010).

According to the Law on Forests of the Republic of Lithuania, consultation and training of private forest owners is financed from the Programme of State Budget for Financing General Forestry Needs (National Report 2013). SFEs are among other institutions involved in the advice and training of private forest owners. The SFEs provide advice to private forest owners on forest management issues and further forestry services. In 2010 SFEs organised 54 training courses attended by 764 private forest owners, and gave advice on forestry to 13,147 private forest owners, and sold 12.8 million tree seedlings.

In recent years, there has been a strong public demand for recreational services. The adaptation of recreational objects in the forests for the needs of disabled is a new phenomenon in Lithuanian state forests. During the last years, over 2,000 recreational facilities have been installed in the state forests. More than 200 of these facilities have been adapted for people with motion disabilities.

**Serbia.** The Law on Forests from 1991 introduced significant changes in the organisation of state for-

est management in Serbia. It was centralised by incorporating management of all state forests in one state enterprise (SE) for forest management, i.e. “Srbijašume”. A smaller part of state forests with a predominant protective function was not covered within the “Srbijašume” forest areas. For management of these forests, separated state enterprises of national parks (Tara, Kopaonik, Fruška Gora and Šerđap) and a state enterprise for the management of protective forests “Borjak” from Vrnjačka Banja were established during the period after 1991.

Until 2000, SE “Srbijašume” comprising 27 forest estates performed forest management and utilisation in the state forests over the whole territory of Serbia. Before restructuring, the parts of “Srbijašume” included three wood processing enterprises and one enterprise for production of food, mineral water and other agricultural products. Restructuring of SE “Srbijašume” started after democratic changes in Serbia (October 5, 2000), based on the programme of economic, organisational and technological changes, and on the initiative of the Government of the Republic of Serbia (Nonić et al. 2011). This included the following activities: privatisation of subsidiary enterprises; separation of non-core activities; renting of forest mechanisation to former employees with the right to buy it, and thus rendering them business partners; optimising and reducing the number of employees through social programmes; separation of the institute for forestry as an independent research institution; reorganising the loss-generating parts of SE etc. The reorganisation of SE “Srbijašume”<sup>1</sup> intended to reduce the number of employees from 9,183 employees in 1992 (Vučićević 2007) to 3,310 in 2010 (Srbijašume 2010) through a programme that would allow employees to become contractors and, eventually, business partners of SE, while utilising the forests (Nonić et al. 2012).

In accordance with the Law on Establishing Specific Competences of the Autonomous Province, 4 forest estates from the territory of Autonomous Province Vojvodina and “Srbijašume – lovoturs” separated from SE “Srbijašume” in late 2002 and formed a new public enterprise for the management of state forests, “Vojvodinašume”. Currently, there are two independent SEs managing state forests: SE “Srbijašume” (in Central Serbia) and SE “Vojvodinašume” (in Vojvodina). SE “Srbijašume” manages 850,752<sup>2</sup> ha (i.e. 71.3% of all state forests in the country) while SE “Vojvodinašume” manages 129,878<sup>3</sup> ha (i.e. 10.9% of all state forest area).

The basic activities of these enterprises are: management of state forests, enhancement and utilisation of multiple benefit functions of forests (including management of protected areas), production of forest

assortments, and exploitation of other forest products and forest recreation, game breeding and hunting. Beside these basic activities, both enterprises perform professional forestry service in private forests.

In Serbia, there are also five national parks. Each national park is managed by its own SE, which were established in 1993, based on the law on national parks. In the national parks, there are three zones of protection. In the 3<sup>rd</sup> zone certain activities, such as forest management and utilisation, are permitted. The SEs of national parks manage around 100,000 ha of forests (Nonić 2010).

**Slovakia.** Forests are divided into the following categories according to their use – commercial forests (71%), protective forests (17%) and special purpose forests (12%). Around 200 thousand ha or 9.2% of forests are still reserved for restitution to unidentified owners (MASR 2011).

Until 1990, forest management had evolved in the framework of centrally planned economy. State forests (including military forests, educational forests and forests managed by the Ministry of Industry) managed 99% of the total forest area (Longauer et al. 2001). Private ownership and use of forests was in practice already up to 1977, until the forest act No. 61/77 and the act No. 100/77 on management in forests and state administration of forestry came into force and abolished “de facto” private use of forests, although private ownership “de jure” was preserved. At that time 99.14% of forests were managed by state forest organizations, while cooperatives used 0.81% and private owners 0.05% of forests (Sarvašova and Tutka 2005). The forestry sector employed 36,000-42,000 persons, then 2% of the economically active population of Slovakia (Lacko 1993). Forest land was managed by forest enterprises, commercial organisations, which were directly embedded in the state budget and centrally planned. Income from production activities (92% from wood products) was insufficient to cover costs, that is why forestry was subsidised by the state budget (Tutka 2000). After 1991, state funds for forestry assistance have been utilised by offering subsidies (Ilavský 2000, 2006), after 1990, Slovakia started the forest restitution process (Belacek 1997, Weiss et al. 2012). The Act on Regulation of Ownership Rights to Land and other Agricultural Assets, e.g. the Land Regulation Act, governed the issues relating to forest land (Schmithüsen and Hirsch 2010).

During the last decades, the organisational management structure of state forests has been modified. Nowadays, in Slovakia the area managed by the state (including rented forests from private owners) is about 55% or 1,066 thousand ha of the total forest area. Forests owned by the state are managed by the state

organisations of forestry (educational forests are excluded) as follows:

- Organisations belonging to the competence of the sector of the Ministry of Agriculture of the Slovak Republic are: “Lesy SR” state enterprise including Forests of the Slovak Republic (manages 920 thou. ha); Forest-Agricultural Estate “Ulič”, state enterprise (21 thou. ha) and State Forests of the Tatra National Park (38.8 thou. ha).

- Military Forests and Estates of the Slovak Republic, state enterprise (67 thou. ha) belongs to the competence of the Ministry of Defence.

Because of the share of managed forest area and the role in state forest sector (e.g. price maker) the major actor is “Lesy SR” state enterprise. The activity of “Lesy SR” state enterprises is described in the special order approved by the Minister of Agriculture in 1999. The forest enterprises provide some forest management services, such as seed purchase, or sale of wood using their own capacities. The remaining forestry operations are entirely outsourced, for example, private companies perform regeneration, afforestation, harvesting and tending, or forest protection activities. Besides the forestry issues, one of the basic goals of forest policy in Slovakia is to enhance multifunctional (functionally integrated) management of forests and protection of the potential of their functions. Ecosystem services, especially outdoor recreation in forests, environmental education, game and wildlife management have gained additional importance. The number of persons employed in the forest enterprises reduced from 34 thousand to 3.6 thousand (MASR 2011).

#### *Cross-country comparison*

Today, while all forests were nationalised in most countries during the socialist era (with the exception of Serbia and Slovakia), state forests comprise less than half of all forest area in the case study countries (Table 2). In the observed countries, the situation differs slightly. In Serbia, in the period after World War II, half of the forests were in state ownership and managed by the SFEs, the other half was in private ownership and managed by private forest owners. In Slovakia, the *de iure* private ownership has never been abolished; forests in the cadastre database were registered to the owners, but managed by state enterprises. In the Baltic countries, during the socialist era, nearly all forests were in public ownership but they were managed differently. Some forests were managed by the SFEs, while the rest of them was managed by agricultural collective farms. The forests managed by the SFEs were generally state-owned before 1940 and they remained state-owned after the large changes that took place in the early 1990s. Forest areas that were

in private ownership before World War II became a part of collective farms, and after the changes in the 1990s, they were either restituted or privatised.

Political and economic reforms in many central and eastern European countries have led to a change of forest sector ownership structure. In the majority of countries (excluding Serbia) the state owned and/or managed ones made up to 90-100% of forests (Table 2) in 1990. After the changes and reforms at the beginning of 1990, state forest ownership was approxi-

enterprises also decreased. There, the majority of commercial forests are managed by the state enterprise Lesy SR, a smaller proportion is managed by the Forest-Agricultural Estate Ulič. In Serbia the second SFE "Vojvodinašume" was formed (2002) from the previous unique "Srbijašume" (established in 1991) (Table 3).

The number of SFEs in Lithuania during the last decades has not changed, but their functions were slightly modified. For example, the SFEs started to play a very strong role in providing recreational services

**Table 2.** Forests by ownership categories in 1990 and 2010

Country	Forest area, ×1000 ha	1990 <sup>1</sup>			Forest area, ×1000 ha	2010		
		Ownership/management by categories (%)				Ownership by categories (%)		
		private	state (public)	other		private	state (public)	other
Estonia	2090	-	100.0	-	2212	45.3	39.9	14.8*
Latvia	3173	1.0	98.7	0.3	3354	47.0	50.3	2.7
Lithuania	1945	-	100.0	-	2160	38.4	49.4	12.2*
Serbia	2313	50.6	49.4	-	2252	47.0	53.0	-
Slovakia <sup>2</sup>	1922	-	100.0	-	1939	49.9	40.9	9.2*

<sup>1</sup> Sources: Data for 1990: FRA 2010 Country reports.

Data of the year 2010: Estonia – Yearbook Forest 2010; Latvia – LAM 2011; Lithuania – LCYF 2010; Serbia – SIRS 1983, Banković et al., 2009; Slovakia – MASR 1996, MASR 2011. All percentage calculations were performed by authors.

<sup>2</sup> Slovakia – management categories

\* Forest land subject to privatisation (Estonia national category) or reserved for restitution (Lithuanian and Slovak national categories)

mately 50% in Latvia, Lithuania and Serbia, but less in Estonia and Slovakia, where it was approximately 4 0%. Four observed countries are new members of the European Union (EU) and one is a candidate (Serbia). The average public ownership for the new EU members (category EU N12) was 67.3%, whereas for all EU members the average public ownership was only 39.7% (RDEUSEIR 2012).

The major forestry reforms were generally carried out at the beginning and middle of the 1990s, in Serbia it happened one decade later. For the preparation of national forestry reforms, all the observed countries have used know-how support or consultancies from other countries or international organisations. The reforms in state forest management have been carried out differently; there are no similar patterns for all the case-countries.

The political and economic reforms and the introduction of a market economy in all observed countries have influenced the state forest management enterprises. The economic activities of forest enterprises, which were not related to forest management (e.g. sawmills), were privatised in the early 1990s. The activities related to forest management have undergone different reforms. The number of SFMOs decreased in some countries (Estonia and Latvia), where only one legal institution (excluding forestry schools and universities, military areas) is dealing with the state-owned forest management. In Slovakia, the number of state

for the society, as well as advisory and forest-related services were offered to private forest owners.

In 2006, a study on state forest sector development was carried out by researchers of Lithuanian University of Agriculture (currently Aleksandras Stulginskis University). Five alternative proposals were presented for state forest sector development: 1) to maintain the structure of 42 state forests enterprises without changes; 2) to merge less efficiently operating state forest enterprises with neighbouring enterprises; 3) to organize large regional units (e.g. out of 10 units); 4) to establish associations of state forest enterprises; 5) to establish one state forest enterprise (Deltuvas et al. 2006). Despite of the heavy discussions about merging the 42 SFEs, changes were not adopted by the Lithuanian parliament decision in 2010 (Resolution 2010).

At present, the state owned commercial forests are managed by the following types of organisations: 1) state-owned joint stock companies such as in Latvia, or 2) state enterprises or other types of profit making

**Table 3.** Number of SFMOs that manage commercial forests

Countries	1990	2010
Estonia	22	1
Latvia	24	1
Lithuania	43	42
Serbia	1*	2
Slovakia	9	2

\*established in 1991

agencies such as in Slovakia, Estonia, Serbia and Lithuania (Table 4).

2009 the felling intensity increased significantly (5.52 m<sup>3</sup>/ha/year) and then for the year 2012 decreased

**Table 4.** Types of SFMOs

Types of SFE	Estonia	Latvia	Lithuania	Serbia	Slovakia
1990					
Under public administration	+	+	+		
State enterprise under law on state enterprises				+	+
2010					
Joint stock company		+			
Profit making state agency	+				
Under law on state enterprises			+	+	+

\* SE “Srbijašume” was established in accordance with the Law on Forests from 1991 and SE “Vojvodinašume” was established in accordance with the Law on Establishing Specific Competences of the Autonomous Province Vojvodina from 2002

In Serbia and Slovakia separate state forest administration and state forest management enterprises for state forest management had existed during the socialist era. In Estonia and Latvia, they were not separated after the countries became independent, different state administrative tasks were separated from the state forest management related activities, and new governmental organisations were established (currently, Environmental Board in Estonia and State Forest Service in Latvia). The state forest administration and state forest management functions were separated in Lithuania as well, but the separation level was not as strong as in Estonia or Latvia. In 1996 the Directorate General of State Forest was established for coordination of SFE activity.

The level of forest utilisation has generally increased, as felling intensities in four countries confirm. In Serbia it has remained on almost the same level (1.70 ... 1.98 m<sup>3</sup>/ha/year), because there were no major changes in the system of state forest management planning and organisation (Figure 1). The trend for Latvia shown in Figure 1 demonstrates the state influence in overcoming the national economic crisis: in

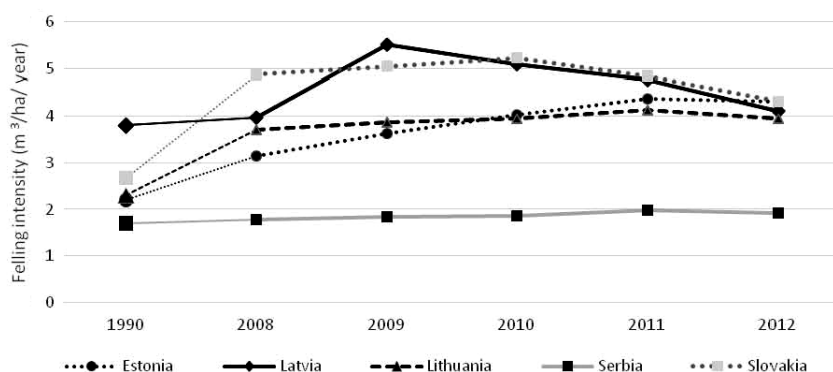
(4.11 m<sup>3</sup>/ha/year) to the same level of Estonia, Lithuania and Slovakia.

In forest management-related areas the previous institutional structures operated with low efficiency, but due to reforms, the number of staff decreased and efficiency increased. The rationalisation and innovations of the forest sector have also influenced forest management activities, and currently, the implementation of many forest operations has been transferred to contractors (Table 6). All the countries outsource a major part of harvesting services; the level of outsourcing of timber transport services depends on the forms of timber sales. Reforestation and forest protection services are not as actively outsourced as services related to harvesting.

**Table 5.** Outsourced forestry operations of SFMOs in 2010\*

Forestry operations	Estonia	Latvia	Lithuania	Serbia	Slovakia
Harvesting	M	M	M	M	M
Transport to buyers	M	M	M	M	S
Afforestation, reforestation	H	M	M	N	M
Forest protection	H	M	S	N	M

\* N is for none, S is for some, H is for half, and M is for major part or all



**Figure 1.** Felling intensity of SFMOs

Sources for 1990: Estonia (instead of 1990, data for 1988 is given), MFNC 1988; Latvia Kronītis 1991, Lithuania LSYF 2010; Serbia Vučićević 2007; Slovakia MASR 1996. Sources for 2008 – 2012: Estonia - Yearbook Forest 2013, the rest – authors calculation

Technical innovations in forestry operations, development of all types of computer based forest information systems and electronic timber sales possibilities, on the one hand, and outsourcing, on the other, have influenced employment in state forestry; these processes have led to a reduction in the number of staff (Table 6). As the outsourcing schemes are different, total forest management practices differ by countries and it is difficult to estimate the influence on employment in the national forest sector. Based on the Estonian estimate, one person employed in the SFMO gives additional employment to approximately four persons in the private sector (RMK 2011). The outsourcing provides employment or entrepreneurship possibilities for foresters, who were dismissed from the SFMOs during the reforms.

Countries	1990	2010
Estonia <sup>1</sup>	7580*	851
Latvia <sup>2</sup>	n.a.	894
Lithuania <sup>3</sup>	14559	3811
Serbia <sup>4</sup>	9813**	3310
Slovakia <sup>5</sup>	34338	3624

**Table 6.** Persons employed in SFMOs

\*1985; \*\*1992

Sources: 1. MFNC 1988, RMK 2011; 2. LVM 2011b; 3. LSYF 2001, LSYF 2010; 4. Data for SE Srbijašume. Vučičević 2007, Srbijašume 2010; 5. MASR 1996, MASR 2011

There are not correct figures to precisely estimate sales methods in the 1990s. In Slovakia, all timber was sold in the form of assortments. In other countries (e.g. Estonia), there has been a combination of stumpage and assortment sales. Due to innovations and different reforms, the share of stumpage sales has decreased while roundwood assortment sales have increased. In countries, where the share of roundwood assortments comprises more than 90%, differences may exist regarding the place of delivery, which determines outsourcing needs for timber transport services (Table 7).

**Table 7.** Forms of timber sales (%) in 2010

Indicators	Estonia	Latvia	Lithuania	Serbia	Slovakia
Stumpage	1	30	8	29	-
Harvested assortments	99	70	92	71	100

Currently Estonia's RMK is selling all assortments delivered to buyers' yards, where actual measurement of the timber is in the buyer's responsibility. 85% of logs are sold under long-term contracts at a negotiated price, but smaller quantities are sold in pre-negotiated biddings and auctions. With long-term contracts, logs are sold to timber companies located in Estonia. Furthermore, 85% of pulpwood are sold under long-term contracts and 15% are sold in auctions. Auctions are held to obtain price information and provide opportunities for new customers. Firewood contracts are

made for different periods, and the smallest quantity is a truckload; the largest quantities are sold under long-term contracts, with a maximum length of five years. Long-term contracts guarantee stability for both sellers and buyers, allowing clients, mostly local timber companies, to engage in the stable business environment. (RMK 2014)

In Slovakia, the "LESY SR" state enterprise has concluded sales contracts for a period of more than one year for approximately 40% of wood. Other contracts are usually concluded for a period of three months or one year. A basic condition for concluding sales contracts is to provide collateral to the seller, i.e., a permanent deposit or bank guarantee. Approximately 5% of wood is sold through electronic auctions, public auction prices are quoted in parity point of sale (hauling place or expedition warehouse) without loading the vehicle. Transportation from point of sale is carried out by customers at their own expense

Changes in the SFMOs have generally been based on bigger discussions: national forestry policies or programmes, forestry legislation or specific acts of the SFMO establishment. Something related to forest product sales is always in the background, along with the facts on how all countries' woodworking industries would benefit from state forests. For instance, according to the Estonian Forest Act, the supervisory board of RMK has 9 members: two parliament members, four representatives from different ministries and three experts upon the proposal of the minister, responsible for the field (currently, the Minister of the Environment). Generally, one expert, as a member of the supervisory board, has been assigned from the domestic woodworking industries or forestry related firms.

In countries where there is only one large SFMO, the state role in stabilising the local timber market is evident, especially during economic crisis or natural disasters. If there is a storm damage in forests and it is impossible to quickly carry out roundwood assortment sales contracts to supply woodworking industries near damaged areas, a large organisation can fulfil the same contract by delivering a specific assortment from remote areas within the same SFMO, a type of practice that has existed, for example, at the RMK. In Lithuania there are 42 separate SFEs, and each of them is responsible for its own sales contracts. From the beginning of 2012 the Electronic System of Roundwood Sales AMEPS (auctions) started to operate in Lithuania (LSF 2013). This system ensures transparency of roundwood sales in state forest sector and attracts larger timber buyers, who can pay a higher price.

The advantage of large SFMOs can be observed in cases of long-term outsourcing contracts. If one large organisation is outsourcing to a private compa-

ny for a specific forestry operation, the subcontractor can operate in larger territories and the SFMO can set the priorities within the organisation. In cases, where there are several smaller SFEs, the subcontractor might have contracts with several SFEs and it will be difficult to agree on seasonal priorities with several employers.

As of 2010, the control and advisory function of private forest owners is delegated to the SFMOs in Serbia (Table 8). The SEs have considerable influence on the private forestry sector in Serbia, where they can offer the following services to private forest owners: elaboration of forest management plans, marking trees for felling, calculation of fees for felled and marked timber, and control and recording of implemented activities (Srbijašume 2014b). In Lithuania, the SFEs provide forest related services, such as advising, marking trees for felling, reforestation, harvesting and forwarding, and selling of seedlings for forest planting. In Slovakia and Estonia, the SFMOs also manage woodland for (temporarily) unknown private owners. Mostly there are unclear owners, e.g., heirs, who have not claimed their properties. In Slovakia, some private owners lease the forest to the SFMOs and do not manage it themselves.

and 2010 are not fully comparable, with implications on the cross-country comparison in the same year.

Environmental management has gained importance within the framework of sustainable forest management, with social issues likely to play an increasing role in multifunctional utilisation of forests and ecosystem services. The changes in the forestry sector have resulted in ecosystem services becoming more important for state forests. For example, nature-protected areas make up to 45.7% of forest area managed by state forest enterprises in Slovakia today, whereas in 1990 the figure was only 37% (Table 9). In some countries, the share of protected forests in state forestry is higher than in average. For instance, according to an expert opinion based on Estonian national forest inventory data, and including all the IUCN (International Union for Conservation of Nature) protected area management categories I...IV, the share of protected forest areas in the RMK forests were 20%, in other ownership groups 4%, for all Estonia in average 10% (Adermann 2015)

At the end of the 1980s, in Estonia almost all SFEs had some budget for recreational use. In many forest districts, special educational clubs called 'school forest districts' existed. As a result of the 2008–2009 re-

**Table 8.** SFMOs and private sector (2010)

Indicators	Estonia	Latvia	Lithuania	Serbia	Slovakia
Forest management planning for private forest owners is delegated to SFMOs	N	N	N	P	N
Control of private forest owners is delegated to SFMOs	N	N	P	Y	N
Advisory service for private forest owners is provided by SFMOs	N	N	P	Y	N

N is for No, Y is for Yes, and P is for Partly

After the accession of Estonia, Latvia, Lithuania and Slovakia to the EU, the governance of natural resources in these countries has gained even greater international importance. In this context, the governance of natural resources must now also follow European Community development and environmental conservation objectives and commitments in addition to domestic priorities. The statistical data related to environmental protection or forest protection is generally given on the national level, based on harmonised criteria. Table 9 shows the shares of protected forest areas according to the MCPFE (Ministerial Conference on the Protection of Forest in Europe) assessment guidelines classes of 1.1, 1.2, 1.3 and 2. Generally, the SFMOs are not calculating the comparable data of their organisations; moreover they are publishing the information according to the national legislation in the given period. The shares of protected forest areas of the SFMOs in Table 9 describe the situation in the selected countries in specific years, thus the data of 1990

**Table 9.** Shares of protected forest areas (%)

Countries	Share of protected forest areas in SFMOs (%)		Share of country's protected forests area from total forest area <sup>6</sup>
	1990	2010	2010
Estonia <sup>1</sup>	28*	36	22
Latvia <sup>2</sup>	n.a.	26	14
Lithuania <sup>3</sup>	38**	27	17
Serbia <sup>4</sup>	n.a.	45	n.a.
Slovakia <sup>5</sup>	37	46	43

\*1985; \*\*1988; Sources: 1. MFNC 1988, Yearbook forest 2010; 2. LVM 2011a; 3. MUM 1991, LSYF 2010; 4. Vučićević 2007, Srbijašume 2010, Vojvodinašume 2014a; 5. Expert opinion, unpublished data; 6. Forest protected according to MCPFE Assessment Guidelines Classes 1.1, 1.2, 1.3 and 2. Authors calculation, based on MCPFE 2011 data

forms in the forestry sector, the RMK had to take over the management of national parks and some educational activities related to nature. For that purpose, the RMK has a structure called a Nature Management Department that is responsible for practical activities and

visitor management in state-owned areas: five national parks and approximately 40 other protected areas. In addition, the Nature Management Department has created 13 recreational areas with different facilities across Estonia. The RMK established 17 Nature Centres, which primarily disseminate various informational materials and handle a variety of educational projects. Whereas the school forest district was a side activity of foresters during the socialist era, specially trained persons handle educational activities related to nature under the new structure.

In Slovakia, many foresters are now trained in forest pedagogy and they provide environmental education in addition to their daily forestry work. In Latvia, the LVM has a special branch called Mammadaba (Mother Nature) for educational and recreational programmes, where the Tērvete Recreation and Nature Park is the most well-known area to visit. Currently, the SFMOs also manage forestry museums, e.g., Sa-gadi in Estonia, Jaunmokas Castle in Latvia, and the open-air museum in Čierny Balog, Slovakia.

## Conclusions

The main objective of the study was to clarify changes in the state forest enterprises during the last 20 years in 10 selected countries of central and Eastern Europe. The analysis covered five post-socialist countries: Estonia, Latvia, Lithuania, Serbia and Slovakia. Some common elements can be identified in the SFE reforms:

- reforms were implemented due to the introduction of market economy, restitutions and privatisation;
- reform processes have been gradual, taking time, and have often been implemented step-wise (gradualism approach);
- some countries, which used know-how support or consultancies from other countries or international organisations for national forestry reforms, showed more radical reforms in the state forest management;
- reform processes have covered all key functions in state forest management organisations: reorganising state forest administration, development of forest information systems, forest management operations, sales of timber products, recreation and related educational activities, and in some countries advisory and practical services for private forest owners;
- forest area managed by the state, the number of SFMOs and the number of employees have decreased. Nowadays a significant part of forest works is performed by contractors, which has offered occupation and entrepreneurial possibilities for people, who previously worked in the SFMOs;

- the intensity of forest utilisation has generally increased, and roundwood assortments dominate timber sales;
- in some countries, the SFMOs have a role in stabilising timber markets;
- environmental management has gained importance within the framework of sustainable forest management, implementation of the EU environmental policy (e.g. NATURA 2000 directives), or multifunctional utilisation of, for instance, forest ecosystem services. There is a trend that there are more protected areas in state forests than in private forests;
- recreational activities are becoming an important service provided by the SFMOs on a non-commercial basis. The countries that have one large organisation for state forest management can afford special departments or subsidiaries, which manage specific facilities for nature or forest related educational and recreational purposes.

## Acknowledgments

*The authors would like to thank the EFI regional office EFICEEC for the opportunity to participate and conduct research in the 2010-2012 project "Innovation and sustainability in forestry in CEE: challenges and perspectives (SUSI-CEE)" funded by the Austrian Ministry of Science.*

*Diana Mizaraite's research findings were obtained through the long-term research programme "Sustainable forestry and global changes".*

*Some of Meelis Teder's research findings were collected by the support of Estonian Environmental Investment Centre Forestry Programme under the project "Innovation in the forest sector".*

*Zuzana Sarvačová was supported by the Slovak Research and Development Agency under contract No. APVV-0057-11 and the Czech Agency for Agriculture Research under contract No. QJ1220313.*

*Authors would like to thank the anonymous reviewers and Dr Bernhard Wolfslehner from EFICEEC office, for their valuable comments.*

## References

- Adermann, V.** 2015, leading specialist of forest inventory of Estonian Environment Agency. E-mail 04. 03. 2015.
- Alam, Q., Nguyen, T. H. and Majumdar, N.** 2009. Shock therapy versus gradualism: the Central Eastern Europe (CEE) and East Asia compared: a review of literature. *International business research* 2(2): 3-8.
- Assaf, G. B.** 1998. Enterprise restructuring in Central and Eastern Europe (CEE) and the former Soviet Union: the roles of technical assistance. In: Cook C., Kirkpatrick C. & Nixon, F. (Editors). Privatization, enterprise development and economic reform: experiences of developing

- and transitional economies, Edwards Elgar, UK, p. 129-149.
- Banković, S., Medarević, M., Pantić, D. and Petrović, N.** 2009. The National Forest Inventory of the Republic of Serbia - the growing stock of the Republic of Serbia. Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia, Directorate for Forests, Belgrade, 238 pp.
- Belacek, M.** 1997. Historical and present organisation and tasks of state forest service of the Slovak Republic. *Slovak Forest* 53: 24 pp.
- Dallago, B.** 2003. Small and medium enterprises in Central and Eastern Europe. University of Trento and Hitotsubashi University. 14 pp. (accessed 29.02.2012). Available: [http://src-h.slav.hokudai.ac.jp/pdf\\_seminar/031210smes\\_3.pdf](http://src-h.slav.hokudai.ac.jp/pdf_seminar/031210smes_3.pdf).
- Dehejia, V. H.** 2003. Will gradualism work when shock therapy doesn't? *Economics & Politics* 15(1): 33-59.
- Deltuvus R., Činga G., Laurinavičius E., Mažeika J.** 2006. The Means and Action plan of Implementation of the Lithuanian Forestry Policy and Implementation Strategy for Years 2007 –2010 (in Lithuanian). Lithuanian University of Agriculture. Research work ordered by the Ministry of Environment of the Republic of Lithuania. 2006. 108 pp.
- DFSL 2001. Latvijas meža sektora attīstība: priekšlikumi normatīvo aktu izmaiņām ekonomiskās efektivitātes paaugstināšanai meža apsaimniekošanā [Development of Forest Sector in Latvia: proposals for changes in normative acts to increase economic effectiveness of forest management]. Kuldīga, 45 pp. (in Latvian).
- Dudutis, D. and Lazdinis, I.** 2008. Evolution of Lithuanian State Forestry Sector – Has Time Come for a Next Stage? *Environmental Research, Engineering and Management* 4(46): 23-28
- Etverk, I.** 2005. Taasiseseisvunud Eesti metsapoliitika ja seadusandluse kujunemine aastani 2005 [Development of Estonian forestry policy and legislation after re-establishment of independence, until 2005]. Tartu, 363 pp. (in Estonian).
- EUSTAFOR 2014. Welcome to EUSTAFOR. <http://www.eustafor.eu/> (accessed 02.06.2014)
- FAO 2010. Global forest resources assessment 2010 Global tables. Available <http://www.fao.org/forestry/fra/fra2010/en/> (accessed 18.03.2013).
- Forest Act 1998. Metsaseadus 1998 (in Estonian). <https://www.riigiteataja.ee/akt/33469> (accessed 15.06.2014).
- FRA 2010 Country reports. Global Forest Resources Assessment 2010 country reports. Available in <http://www.fao.org/forestry/fra/67090/en/> (accessed 18.03.2013).
- Grišāns, V.** 1990. Mežrūpniecība un mežsaimniecība [Forest management and forest industry]. Reports, Nr.1 . 80 p. (in Latvian).
- Hare, P. G. and Huges, G.** 1991. Competitiveness and industrial restructuring in Czechoslovakia, Hungary and Poland. CEPR Discussion paper, 59 pp.
- Hlavský, J.** 2000. Seminar on recent institutional development in the forestry sector in Central and Eastern European countries. Forest research institute, Zvolen, 150 pp.
- Hlavský, J.** 2006. 15 years of economic in transition: lessons learned and challenges ahead for the forestry sector. A contribution to the work of the UNECE Timber Committee and the FAO European Forestry Commission. Finnish Forest Research Institute, Joensuu, 74 pp.
- Kallas, A.** 2002. Public forest policy making in post-communist Estonia. *Forest Policy and Economics* 4: 323- 332.
- Katz, S.** 1995. Some key development issues for transitional economies-east and west. In: Naya S. F. N. and Tan. J. L. H. (Editors), Asian transitional economies: challenges and prospects for reform and transformation. Institute of Southeast Asian studies, Singapore, p. 9-25.
- Klapper, L. F., Allende, V. S. and Sulla, V.** 2002. Small and medium enterprise financing in Eastern Europe. *World Bank policy research working paper* No 2933, 52 pp.
- Kronītis J.** 1991. Mežrūpniecība un mežsaimniecība [Forest management and forest industry]. Reports, Nr.5: 4-6 (in Latvian).
- Lacko, M.** 1993. Možnosti nelegislatívneho vplyvu štátnej správy v rôznych formách vlastníctva lesa.[Possibilities of non-legislative effects of state administration in various property regimes]. Lesníctvo a vzhľad v meniacich sa ekologických a ekonomických podmienkach v SR: 118-124 (in Slovak).
- LAM 2011. Development of Forest Sector 1990-2010. Latvian Agriculture Ministry, 38 pp.
- Larsen, P. V. and Brukas, V.** 2000. Scenarios for the Future Lithuanian State Forest Sector. *Baltic Forestry* 6 (2): 29–40.
- LFIF 2008. Forest sector in Latvia 2008. Latvian forest industry federation. Riga, 32 pp.
- Longauer, R., Ilavský, J. and Moravčík, M.** 2001. Country report – Slovakia. In: Forest and forestry in Central and Eastern European countries – II, p. 93-101.
- LRAM 2003. Lietuvos miškų metraštis. XX amžius [The chronicle of Lithuanian forests XX century]. Editors L. Kairiūkštis. Vilnius, 632 pp. (in Lithuanian).
- LSF 2013. Lithuanian State Forests – Lietuvos Valstybiniai Miškai 2012 – 2013. Directorate General of State forests at the ministry of Environment Republic of Lithuania, 39 pp.
- LSFS 2013. Annual Ring 2013. Latvia State Forest Service, 38 pp.
- LSYF 2001. Lithuanian statistical yearbook of forestry 2001. Ministry of the Environment, Centre of forest economics. Vilnius, 111 pp.
- LSYF 2010. Lithuanian statistical yearbook of forestry 2010, Ministry of the Environment, State Forest Service, 186 pp.
- LSYF 2011. Lithuanian statistical yearbook of forestry 2011. Ministry of the Environment, State forest service. Kaunas, 184 pp.
- LVM 2001. State stock company “Latvijas valsts meži” Annual report, 2001, 20 pp.
- LVM 2011a. Annual report of the year 2010. Joint Stock Company „Latvijas valsts meži Rīga, 9 pp.
- LVM 2011b. Facts and figures. Joint Stock Company „Latvijas valsts meži“. Rīga, 48 pp.
- Marangos, J.** 2003. Was shock therapy really a shock? *Journal of Economic Issues* 37 (4): 943-966.
- MASR 1996. Správa o lesnom hospodárstve v Slovenskej republike. Zelený správa [Green report]. Ministry of agriculture of the Slovak Republic, 49 p. (in Slovak)
- MASR 2011. Správa o lesnom hospodárstve v SR za rok 2010 [Report on Forestry in the Slovak Republic for the year 2010]. Ministry of agriculture of the Slovak Republic. Available online <http://www.mpsr.sk/index.php?navID=123&id=5250> (in Slovak)
- McIntyre, R.** 2001. The Role of Small and Medium Enterprises in Transition: Growth and Entrepreneurship, Research for Action 49, United Nations University, World Institute for Development Economic Research (UNU/WIDER), 63 pp.
- MCPFE 2011. Ministerial Conference on the protection of Forest in Europe. State of Europe's Forest 2011 Report. Annex 8: Output Tables. <http://www.foresteurope.org/docs/>

- SoEF/reports/Annex\_8\_Output\_Tables\_State\_of\_Europes\_Forests\_2011.pdf (accessed 01.12.2014)
- MFNC 1988. Statistilised andmed Eesti NSV Metsamajanduse ja Looduskaitse Ministeeriumi allettevõtete tegevusest XI viisaastakul [Statistical data of the subsidiaries of Estonian SSR Ministry of Forestry and Nature Conservation in XI quinquennium] Eesti NSV Metsamajanduse ja Looduskaitse Ministeerium, 115 pp. (in Estonian).
- MUM 1991. Miškų ūkio ministerija. Miškų ūkio įmonių 1990 m. ir 1986-1990 m. suvestiniai gamybinės veiklos rodikliai [The Ministry of Forestry. Summary data of State Forest Enterprises production activity in the year 1990 and period 1986-1990] Vilnius, 1991, p. 85 (In Lithuanian)
- National Report to the Tenth Session of the United Nations Forum on Forests. 2013. [http://www.un.org/esa/forests/pdf/national\\_reports/unff10/Lithuania.pdf](http://www.un.org/esa/forests/pdf/national_reports/unff10/Lithuania.pdf) (accessed 23.10.2014)
- Nonić, D., Nedeljković, J., Ranković, N., Marinković, M., Glavonjić, P. and Weiss, G.** 2012. Analysis of factors influencing cluster establishment in the Timok forest area in Serbia. *Austrian Journal of Forest Science* 129(3): 202-227.
- Nonić, D.** 2010. Organization and business administration in forestry-textbook. University of Belgrade-Faculty of Forestry, Belgrade (111).
- Nonić, D., Ranković, N., Nedeljković, J., Glavonjić, P. and Marinković, M.** 2011. Transition process in forestry sector in Serbia and selected CSEE countries: Policy and property rights reforms. Proceedings of IUFRO 13<sup>th</sup> International symposium on legal aspects of European forest sustainable development, 2011: 177-187.
- Nordberg, M.** 2007. State forest management reforms in three ex-Soviet republics Reforms, reasons and differences. Doctoral thesis, Swedish University of Agricultural Sciences, Acta Universitatis Agriculturae Sueciae 2007: 67 Uppsala, 51 pp.
- Popov, V.** 2000. Shock Therapy Versus Gradualism: The End of the Debate (Explaining the Magnitude of Transformational Recession). *Comparative Economic Studies*, Vol. 42, No. 1, p. 1-57.
- RDEUSEIR 2012. Rural Development in the European Union Statistical and Economic Information Report 2012. European Commission Directorate-General for Agriculture and Rural Development, 369 pp.
- Resolution 2010. Lietuvos Respublikos Seimas Rezoliucija dėl valstybinių miškų išsaugojimo [Seimas (Parliament) of Lithuanian: Resolution on State Forests Preservation]. 18 March 2010. *Valstybės žinios* 2010-03-25, Nr. 34-1616 (In Lithuanian).
- RMK 2011. RMK Annual Report 2010, 44 pp.
- RMK 2014. RMK sale of timber. <http://www.rmke.ee/sale-o/sale-of-t> (accessed 02.06.2014)
- Saliņš, Z.** 1999. Meža izmantošana Latvijā vēsture, stāvoklis, perspektīvas [Use of forest in Latvia: history, conditions, perspectives]. Jelgava, 272 pp. (in Latvian)
- Sarvašova, Z. and Tutka, J.** 2005. Change in the Ownership and Management of Forests in Slovakia Small-scale Forestry in a Changing Environment. Proc. IUFRO International symposium 2005: 200-207.
- Schmithüsen, F. and Hirsch, F.** 2010. Private forest ownership in Europe. Geneva timber and forest study paper 26. UN, 112 pp.
- SIRS 1983. Inventory of the forest fund 1979. Statistical Institute of the Republic of Serbia, Belgrade.
- SORS 2011. Statistical Office of the Republic of Serbia (2011): Forests felling in 2010, Communication No. 128, Statistical Office of the Republic of Serbia, Belgrade.
- Srbijašume 2010. Plan of business activities for 2010, SE Srbijašume, Belgrade. <http://www.srbijasume.rs/pdf/planposlakt10.pdf> (accessed 04.06.2014).
- Srbijašume 2014a. Forest products, SE, Belgrade. <http://www.srbijasume.rs/proizvodite.html> (accessed 04.06.2014.)
- Srbijašume 2014b. Information booklet, Srbijašume, Belgrade. <http://www.srbijasume.rs/pdf/informator1.pdf>, (accessed 10.06.2014).
- Tutka, J.** 2000. Rozdiely v štátnom a neštátnom sektore lesníctva medzi SR a zahraničím. [Differences in state and private forest sector between Slovakia and other foreign countries]. *Zprávy lesníckého výzkumu* 45(2): 28-31 (in Slovak).
- Vojvodinašume 2014a. Environment protection. SE Vojvodinašume, Novi Sad. <http://www.vojvodinasume.rs/zastitazivotne-sredine/> (accessed 04.06.2014.)
- Vojvodinašume 2014b. Production of timber assortment for 2006, SE Vojvodinašume, Novi Sad. <http://www.vojvodinasume.rs/en/offer/timber-assortment/production-of-timber-assortment-for-2006/> (accessed 04.06.2014).
- Vučičević, S.** 2007. Forests and forestry of Serbia at the end of XX and beginning of XXI century. SE for forest management "Srbijašume", Belgrade (500).
- Weiss, G., Dragai, M., Jarsky, V., Mizaraite, D., Sarvašová, Z., Schiberna, E. and Gudurić, I.** 2012. Success cases and good practices in forest owners' organisations in Eastern European countries. FAO. 35 pp. <http://www.fao.org/docrep/017/ap469e/ap469e00.pdf> (accessed 18.03.2013).
- Yamin, F.** 1998. Operational and institutional challenges. In: Goldberg J. (Ed.): Issues and options: The clean development mechanism. New York, United Nations Development Programme, p.53 - 80.
- Yearbook forest 2010. Estonian Environment Information Centre, 2012. Tartu, 226 pp.
- Yearbook Forest 2013. Estonian Environment Agency, Tartu 2014, 258 pp.

Received 02 May 2012

Accepted 08 October 2015

## Footnotes

<sup>1</sup> Project "Participatory Development of a Plan to Implement Srbijašume's Restructure", conducted during 2005, in cooperation with Austrian Development Agency and Osterreichische Bundesforste AG Consulting gave significant technical contribution to these processes.

<sup>2</sup> Source: <http://www.srbijasume.rs/sumskifonde.html>, accessed 11.06.2014. and authors' calculations

<sup>3</sup> Source: <http://www.vojvodinasume.rs/en/forests/information-on-forest-fund/>, accessed 11.06.2014. and author's calculations