

**SCANDINAVIAN FOREST ECONOMICS**  
**No. 41, 2006**



Proceedings  
of the Biennial Meeting of the  
Scandinavian Society of Forest Economics  
Uppsala, Sweden, 8<sup>th</sup>-11<sup>th</sup> May, 2006

Lars Lönnstedt and Björn Rosenquist (eds.)

Uppsala

# Promoting reforestation in Estonia

Paavo Kaimre\*, Risto Sirgmet & Tarmo Vahter

## Abstract

Reforestation of clear-cut areas has been considered one of the most critical topics of forest management in Estonia during the last 15 years. Experts have given alarming assessments especially about the situation in private forests.

In the paper the use of different tools, implemented by forest authorities for the sake of reforestation has been analyzed. The results of National Forest Inventory and inventories made by the Centre Forest Protection and Silviculture have been used to describe the preliminary results in the forest.

The intervention of government into forest management confined to legislation during the 1990ies but since the end of the century, financial instruments have also been used. It has been planned by the Ministry of Environment to implement a guarantee fund related to forest regeneration. Costs and benefits of creating such a guarantee fund were analyzed. Preliminary calculations indicated that long-term revenues and short-term costs were almost equal when taking into account all private forests. Authors suggest to link guarantee payments with financial incentives.

**Key words:** reforestation, forest policy, financial incentives

## Introduction

Remarkable changes have been taken place in Estonian forestry since regained independence in 1991 and some of the changes have been favoured *ex post*, some have been criticised. Smooth transition from planned economy to market economy, re-establishment of private property, institutional changes in state forest management are considered successful achievements. One of the topics which makes stakeholders worry, is reforestation in privately owned forests.

Socio-economic changes in the end of 1980-ies led to the implementation of important changes in forestry. The biggest transformation took place in financing and organisational institutions, also in forest management. In the first project of Estonian Forestry concept, compiled by Malev Margus in autumn 1988, the question of reforestation was mentioned: *to influence the relationship between conifers and deciduous trees via forest management so, that the amount of conifers should be 50-75% and to enlarge the area of spruce stands in fertile forest types and lessen the area of deciduous trees* (Etverk, 2005).

In 1990-ies the ideas of close-to-nature forestry spread in Estonia, which in turn resulted in natural regeneration and hence the growth of deciduous stands more than coniferous. At the beginning of the new century the situation could be faced where in state forests 68% of felling area was artificially regenerated by planting and sowing, in private forests the per cent was only 13 between 1999-2003 (Centre of Forest Protection and Silviculture, 2006). The possible reasons of low rate of reforestation besides general attitude were also unwillingness of forest owners to make extremely long-time investments.

The article gives an overview of the problems concerning regeneration, describes legislative means in guaranteeing regeneration and analyses the costs and benefits of implementing the guarantee fund.

## Material and method

The most important documents and publications since 1988 when reforms started in forestry were used to get a background for the decisions influencing reforestation. Two Forest Acts and a new draft act were analysed from the point of view of forest regeneration.

The data is gained from the National Forest Inventory and inventory carried out by the Centre of Forest Protection and Silviculture, in which the results of regeneration of clear-cut areas between 1995-1999 were assessed (Centre of Forest Protection and Silviculture, 2004; 2005).

To estimate the cost and benefits of implementing the guarantee fund, the additional revenue gained from managing economically valuable stands instead of low value stands were calculated. Managers of three County Environmental Departments were interviewed in order to estimate the administrative costs. In making calculations, it was presumed that guarantee payments is implemented for all private forest owners in all reforestation areas.

## Situation in reforestation

As mentioned above, the most problematic issue in Estonian forestry after transition period concerned reforestation in private forests. Critical statements considering both environmental and economic aspects have been published.

The inventory carried out in 2003 about the clear cut areas between 1995-1999 revealed that the problem is not a quantity of regeneration, but its character. According to the requirements set in Forest Act, the regeneration is sufficient in 80.8-89.1% of the clear cut areas. The distribution of tree species is troublesome because a big share of economically valuable stands are naturally replaced by less valuable tree species. Figures presented in the table 1 describe the harvesting of timber by tree species in Estonian forests. Figure 2 illustrates the prevailing trend - clear-cut areas are regenerating with deciduous tree species.

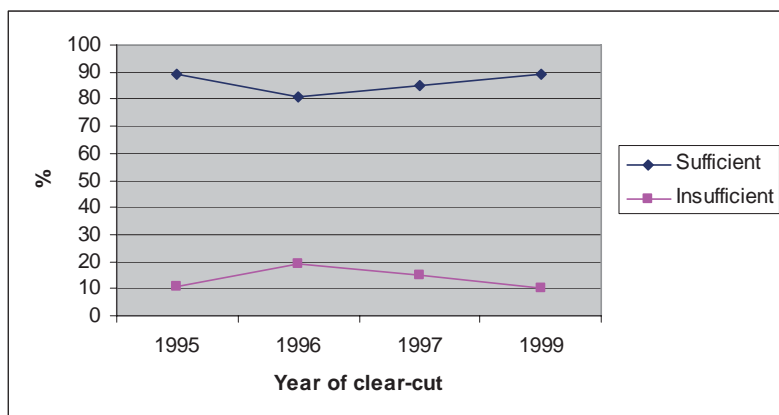
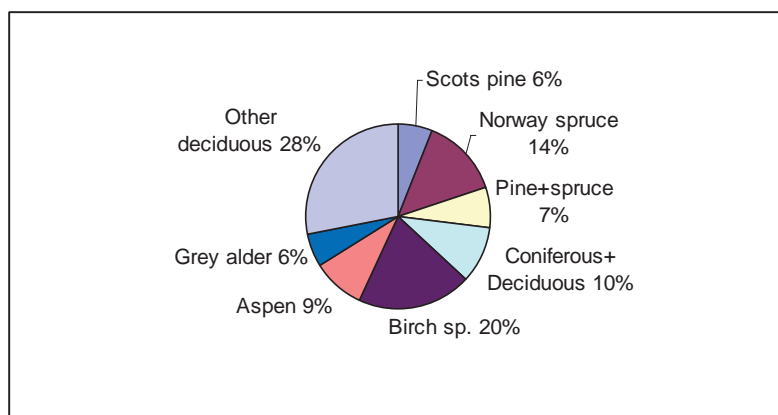


Figure 1. Results of reforestation by inventory made in 2003 (Centre of Forest Protection and Silviculture, 2004)

**Table 1.** Comparison of suggested and actual harvesting volume by tree species.

Tree species	Suggested annual harvesting volume 2001-2010, million m <sup>3</sup>	Actual annual harvesting volume 1999-2003, million m <sup>3</sup>
Scots pine	2.1	2.5
Norway spruce	3.2	5.0
Birch sp.	2.6	2.0
Aspen	1.8	1.2
Black alder	0.5	0.4
Grey alder	2.3	0.5
Other species		0.2
<b>Total</b>	<b>12.6</b>	<b>11.8</b>

Comparison of data indicates that Norway spruce and Scots pine give a biggest share of cutting volume – 42% and 21% respectively. At the same time, the area where spruce and pine grow in young stands, is 37% only. It means that the share of coniferous stands is decreasing in Estonia at present. As a consequence of natural processes and silvicultural measures, the composition of stands probably changes in favour of coniferous species during the decades. But still the 28% share of “other tree species“, which are non-forest trees (mainly Bird Cherry (*Padus racemora*), Common Rowan (*Sorbus aucuparia*) etc.) is alarming. Forest officers and policy makers are trying to find and implement relevant instruments to improve the situation.



**Figure 2.** Distribution of reforested areas (1995-1997 and 1999) by tree species.

The inventory of clear-cut areas shows that the most critical from the regeneration point of view are spruce stands on Hepatica, Oxalis and Oxalis-Myrtillus site types (Centre of Forest Protection and Silviculture, 2005).

### **Legislation and reforestation**

One of the most important tasks of the Forest Act approved by the Parliament in October 1993, was to create an environment and conditions for the private forest ownership in Estonia. Society which until this time acted in the command economy, believed that market economy, based on the private property, guarantees wise decisions and sustainable development. The ideology of Forest Act was based on the idea that forest owner itself makes the best decisions, therefore quite less regulations were written into the Act.

Concerning the reforestation, it was stated in the Forest Act that forest owner has to reforest clear-cut areas within five years and use genetically high quality breeding material.

The next Forest Act which was approved by the Parliament in 9.12.1998, tackled the reforestation more profoundly. The main principles are the following: it is required to reforest all clear cut areas and perished parts of protection and commercial forests with an area of more than 1 ha within three years after the cutting or perishing thereof. If an area has not regenerated within seven years after the cutting or perishing, the Ministry of the Environment shall organize its reforestation at the owner's expense.

In the draft of the new Forest Act which is already sent by the Government to the Parliament, strong efforts have been made to activate forest owners to reforest clear-cut areas. A new instrument for the Estonian forestry is a guarantee fund (the forest owner has to transfer a certain sum of money to the special account before he/she could start the clear-cut).

The implementing of guarantee fund is compulsory in certain forest types and in areas bigger than 2 hectares. The question of guarantee fund has caused numerous discussions amongst stakeholders – private forest owners are generally against it, but environmental organisations support the idea. Norwegian experience – the Forest Fund was taken as a model while elaborating the guarantee fund as a forest policy tool.

### **Economic incentives**

Financial incentives have been widely used as an instrument of economic policy. The study "Evaluating Financing of Forestry in Europe" revealed that in 1990-ies the share of direct and indirect financial support for private forestry compared to other countries was the lowest in Estonia (European Forest Institute, 2005). At the beginning of 1990-ies the government paid subsidies were marginal according to the general economic policy.

In year 2000 when through the Private Forestry Centre private forest owners started to receive support for soil preparation, the volume of reforestation in privately owned forests was 1987 hectares. In year 2004 the planting and sowing area covered more than 3600 hectares (Centre of Forest Protection and Silviculture, 2006). The remarkable growth of forest cultivation is due to the increase of planting which gives better results compared to the sowing but it is also more expensive.

**Table 2.** Subsidies and reforestation in private forests in 2000-2005

Year	Financial support, EUR	Area of soil preparation, ha	Area of reforestation, ha
2000	11800	179	1987
2001	11900	173	2770
2001	38600	588	2765
2003	42850	626	3699
2004	51100	924	3604
2005	91400	1300	Data not available

### Results and discussion

The tree species and age composition of Estonian forests enable to harvest a big share of coniferous stands. High timber prices as a consequence of demand also increase the harvest volume of spruce and pine stands. At the same time, the regeneration of cutting areas takes place mainly with deciduous species. Natural processes and silvicultural measures influence the tree species composition in young stands within the next decades, probably in favour of coniferous species. Still the 28% share of “other tree species“, which are non-forest trees (mainly Bird Cherry (*Padus racemora*), Common Rowan (*Sorbus aucuparia*) etc.) on reforestation areas is alarming. Forest officers and policy makers try to find and implement relevant instruments to improve the situation.

Legislation, especially the Forest Act, has been considered to be the most important tool of forest policy. The rules concerning reforestation have become more strict and detailed in the legislation. The key-elements of reforestation and their treatment in Forest Act are presented in the table 3.

**Table 3.** The treatment of reforestation in Forest Act

	Fores Act 1993	Forest Act 1998	Draft 2006
Maximum interval between clear-cut and reforestation	5 years	3 years	2 years
Maximum period of regeneration	5 years	7 years	5 years
Minimum number of trees per hectare	Not determined	1200	To be determined by Forest Management Instructions

Poorly regenerated clear-cut areas have negative impact on economy and environment. Non-regenerated areas suffer from decreasing area of forest habitats, the threat of erosion increases and the defending function against wind decreases. Furthermore, non-regenerated areas do not enable to harvest neighbouring stands. Efficient land usage could not take place, resulting in a loss of future revenues for the whole economy.

According to the calculations, hundreds of millions of *kroons* extra income can be obtained by forest owners during the rotation period when less valuable species in

regenerated areas will be substituted by economically more valuable ones. Extra income per year is about 3 million *kroons* (by optimistic scenario it is 6-7 million *kroons* per year).

Expenses in public sector will increase when implementing the guarantee fund. The growth in administrative expenses per 15 County Environmental Departments is at minimum 1.05 million *kroons*. Employing additional officers for the administration (incl. control and monitoring) of the guarantee fund, the total annual costs are 4...5 million *kroons* which means that the extra benefits and costs are almost equal.

It is extremely important to find out and implement policy tools which favour and support the reforestation in privately owned forests. In addition to the guarantee payments the existing means already included into legislation (sanctions, reforestation by authorities at owner's expense etc.) have to be used by the governmental departments.

To increase the reforestation with coniferous species, the combining of guarantee fund and financial incentives would be an opportunity. It is important to the forest sector and economy to keep the share of coniferous forests at the same level and therefore tax concessions could be applied for young cultivated stands.

As Estonian economy is moving from liberal, "invisible hand" ruled model to the economy using more and more financial and regulatory tools, then the same tendency is characteristic in the forestry. Forest economists can participate in the process, providing relevant analyses and making knowledge based suggestions.

#### **References:**

- European Forest Institute, 2005. Evaluating financing of forestry in Europe. Executive summary. <http://www.efi.fi/projects/effe/Deliverables/>
- Centre of Forest Protection and Silviculture, 2004. Lagersaialade inventeerimine metsauendamise vajaduse väljaselgitamiseks.[The inventory of clear cut areas for the investigation of reforestation needs]. Tartu. 28 lk. In Estonian.
- Centre of Forest Protection and Silviculture, 2005. Lagersaialade inventeerimine metsauendamise vajaduse väljaselgitamiseks. [The inventory of clear cut areas for the investigation of reforestation needs].Tartu. 27p. In Estonian.
- Centre of Forest Protection and Silviculture, 2006. Yearbook Forest 2005. Tartu. 175p.
- Etverk, I. 2005. Taasiseseisvunud Eesti metsapoliitika ja –seadusandluse kujunemine (aastani 2005) [The forest policy and forest legislation of Estonia (until 2005)]. Tartu. 363 p. In Estonian.