

# Financing problems of Lithuanian forestry

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Economic changes over 1991-1995 preconditioning the financing system of Lithuanian forestry were ascertained. Namely, free wood trades, increase in felling timber prices and export, profit dynamics, appearance of private ownership. Now Lithuanian forestry is financing from forest income (forest fund). A standard forest fund planing method is suggested. It is based on the projected volume of operations as well as on income and expense standards. Forest fund project model of 1996 are presented.

Lithuanian Forestry Act foresees a possibility of additional forestry financing from the state budget. The paper provides objective causes predetermining it, the main tendencies of budget financing and financing standards.

**Keywords:** forestry, financing, forest fund, budget, standards.

## Introduction

Recently post-communist countries under-go transition to market economy. Therefore, many forestry economics and management problems arise: new ownership forms, market prices, financing, management structures, economic relations with foreign countries. Their solution is specific, for it depends on forest growth time, social and ecological significance of forests, and on the diversity of forest resources and functions. Especially urgent are the questions of forestry financing. Most countries under-going transition to market economy, including Lithuania, suffer from economic difficulties. Therefore, in forestry budget financing is replaced by that of forest income.

All economic solutions are based on the analysis of forestry income and expense. It is necessary to ground economically forest exploitation and regeneration, to assess forests and to define taxes. Actual income and expense are calculated according to accounting data. For planning, forecasting or other modelling of forestry situations a standard method for the analysis of forestry income and expense is required. It is based on projected (standard) volumes of forest exploitation and forestry operations as well as on income and expense standards. Urgency of the work is preconditioned by the current Lithuanian forestry financing from forest income and annual forest fund estimation. Based on them a centralized share of forest fund and grants for forest enterprises are determined. Only by applying the standard forest income and expense analysis method it is possible to simulate economic forestry situations and to prepare for them in advance.

Methodical questions on standard planing in Lithuanian forestry were tackled in the works of O. Ancukevičius (1970), R. Skarbalis (1977). Some principles for working out expense standards are given in the recommendations of forest profitability assessment (Mizaras 1993). In countries of market economy income expense analysis was widely applied to ground forestry projects (Gregersen 1992), to assess technologies of different forestry operations (Busby 1989), to work out optimal forest felling programs (Eriksson 1994). These works are useful in creating a standard method to ascertain forestry income and expense, although they should be supplemented and specified regarding Lithuania's economic conditions. Lithuanian forest fund is aimed at forestry financing. It is planned every year according to forest condition, forest management projects and financing standards. The main source of income is timber sales. This income finances afforestation, cleaning, protection, harvesting. World experience in forestry financing shows, that very often forestry has to be financed from state budget. This is preconditioned by the immense socio-ecological significance of forestry, a long forest growing period, increasing negative anthropogenic effect on forests. These problems are actual in Lithuania as well. Increases the area of protected territories, frequent wind throws, mass die-off in spruce stands, appear small private forest holdings. The Forest Act of the Lithuanian Republic foresees a possibility to finance forestry from the state budget. However, practically solving of the problem has just started.

The paper presents forestry financing principles, economic changes in Lithuanian forestry over 1991-1995, methodical

questions on forest fund planning and subsidising from the state budget, and standards for forestry financing.

**Principles of forestry financing**

The principal forestry financing sources in market economy countries is the income of forest owners and managers as well as state resources. The share of means from state or municipality budget is preconditioned by forest resources, nature protective and taxation policy. In countries (for instance, Sweden) where forest resources are great and forest taxes have been abolished, subsidies from the budget are less (Fredriksson 1994). State subsidies here are provided for liming acid forest soil due to air pollution, regeneration of broad leaved forests and pre-commercial thinning for forest owners performing in their forests special nature protective, recreation, landscape improvement and cultural heritage preservation measures.

In Germany forest income covers 60% of expenses in state forests (Petrov 1995). Here from state or land budget are financed 50-60% of expenses for afforestation, pre-commercial thinning, regeneration of dead forests, forest road construction, upkeep of organizational structures (Forstliche Forderung, 1995).

In Finland forest farmers receive state subsidies, preferential credits, tax privileges, free provision with planting material grown in state nurseries. Forest management expenses are financed from two sources: state budget and incomes from managers (in per cent from timber sold) (Fihinen 1992). Seeking to aid private forest owners, state budget involves forest improvement fund. It provides subsidies for afforestation, pre-commercial thinning, pruning of growing trees, forest fertilisation, drainage and road construction. Up to 80% of expenses are subsidised depending on forestry conditions. Forest owners may receive loans from the above mentioned fund (Forestry legislation ..., 1992).

**Economic changes in Lithuanian forestry over 1991-1995**

After the restoration of independence in 1990 Lithuanian forestry underwent essential economic changes. Growing stock and commercial wood started to be sold not according to allocation, but in forest enterprises under free market conditions. Forest felling in state forests increased from 2.6 million m<sup>3</sup> in 1986 up to 5.3 million m<sup>3</sup> in 1995 (Table 1). Causes of this increment were favourable market (especially export) conditions, wind throws and withering of spruce stands, increase in the norm of final fellings.

Prices for growing stock were periodically rising. The lowest limit is defined by the Ministry of Forestry. Raw material

**Table 1.** Harvesting in Lithuania (1986-1995 in forest enterprises)

Year	Final cutting, thousand m <sup>3</sup>	Intermediate cutting, thousand m <sup>3</sup>	Total, thousand m <sup>3</sup>
1986	1649.1	993.9	2643.0
1987	1636.0	1041.8	2677.8
1988	1709.3	1110.4	2819.7
1989	1613.8	1144.8	2758.6
1990	1552.7	1114.7	2667.4
1991	1843.7	1064.5	2908.2
1992	1815.5	1348.2	3163.7
1993	1455.3	3053.8	4509.1
1994	1816.7	2177.0	3993.7
1995			5277.7
Prognosis			
1994-2003	3224	1830	5054
2004-2013			5516
2014-2023			5860

*References:* Production indices of forest enterprises. 1986-1990, 1991, 1992, 1993, 1994. Vilnius., MEC news. 1996-1. Lithuanian forestry and timber industry extension program. Vilnius. 1994 (in Lithuanian).

prices were increasing up to the middle of 1995. Later they started decreasing (Table 2). Lithuania from timber importer

**Table 2.** Average price of roundwood assortment on the roadside without value added tax

Year, month	Price, L/m <sup>3</sup>	
	home market	export
1993		
August	32.1	46
November	31.9	50
1994		
January	35.0	58
February	39.2	59
March	42.6	63
April	45.2	66
May	45.1	72
July	43.8	75
August	43.5	77
September	47.7	79
October	53.3	88
November	56.4	93
December	57.8	98
1995		
January	67.5	107
February	69.0	109
March	75.0	109
April	82.0	105
May	80.0	105
June	80.0	104
July	77.9	102
August	76.0	103
September	77.0	101
October	82.0	95
November	78.0	93
December	68.0	88

*References:* MEC news: 1993: August, November; 1994: February, March, April, May, June; 1994: 13-17; 1995-1 (in Lithuanian).

turned to export-oriented country most roundwood was sold by forest enterprises in 1995 - 1066 thousand m<sup>3</sup>.

**Table 3.** Timber export in forest enterprises, thousand m<sup>3</sup>

Year	Roundwood, thousand m <sup>3</sup>	Sawn timber, thousand m <sup>3</sup>
1993	258.8	18.4
1994	609.6	45.3
1995	1065.7	75.5

*References:* MEC news: 1994 January, 1995-1, 1996-1 (in Lithuanian).

Increase in the forest felling, timber prices and export allowed to refuse budget financing.

In Soviet times afforestation, cleaning and protection in Lithuania were financed from the state budget. Stump prices were paid to state budget. They comprised 1/4 of expenses. Since 1991 forestry is not financed from the budget. State forest enterprises cover their expenses from forest income. Up to 1995 forest growing fund used to be worked out. It was equal to the value of growing stock, calculated by estimating the volume being cut in term of growing stock prices. Forest growing operations comprised up to 25% of expenses in forest enterprises (Table 4). There prevailed harvesting. Since 1995 forest fund from timber sales and other incomes was formed. It is used to finance all forestry expenses. Every year forest fund income and expenses are planned based on forest inventory data and standards. Quarterly and annual accounts of its income and expenses are made. The greatest share of the forest fund goes to cover harvesting (57.1%) and management expenses (20.3%). Afforestation receives 3.3%, pre commercial thinning 0.9% (data of January-September 1995).

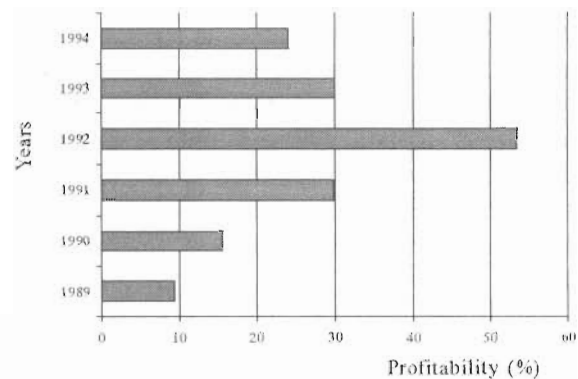
**Table 4.** Forest growing fund in 1991-1994.

Year	Measuring unit	Expenses from forest growing fund	Production expenses	Total	From them forest growing expenses, %
1991	mln. rb	71.4	209.7	281.1	25.4
1992	mln. TL	574.3	1961.3	2535.6	22.6
1993	mln. Lt	19.2	75.2	94.4	20.3
1994	mln. Lt	40.1	149.1	189.2	21.2

*Reference:* Production indicates of forest enterprises. 1991, 1992, 1993, 1994. Vilnius (in Lithuanian).

In 1991-1992 forest enterprises possessed cheap machinery and materials, payments were low, timber prices were increasing. Therefore, profitability of forestry was growing as well. Later the situation has changed. The rise of timber prices became slower and stabilized. Vast forest areas were excluded

from exploitation due to expansion of protected territories and forest restitution to private owners. Profitability of forest enterprises started to decrease (Fig.1).



**Fig. 1.** Profitability of forest enterprises (profit and cost ratio).

*Reference:* Production indices of forest enterprises, 1989-1994. Vilnius (in Lithuanian).

Small private forest holdings appeared. About 200 thousand ha of forests are being restituted. Average size of a forest holding is about 5 ha. The problem to compensate restrictions on economic activities for forest owners arose. A part of agricultural land should be afforested. Decrease in forestry profitability, appearance of private forests, expansion of protected territories and necessity to increase the woodedness of the country require budget financing of forestry.

### The structure of forest fund income and expenses

Forest fund is comprised from the income of forest enterprises for sold growing stock, raw materials, and other assets (hunting, Christmas trees, seedlings, etc.). Forest fund resources in forest enterprises are used for establishing plantations, thinning, protection, game management, harvesting, road construction and repair, instalment and maintenance of draining systems, for recreation and nature protective measures, buildings, machinery and equipment, administration and other expenses. Some part of forest fund is centralized in the Ministry of Forestry. These means are used for the following purposes: to compensate forest fund income and expenses of forest enterprises due to unfavourable natural and economic conditions; to finance state forestry development programs; forest inventory; research and projecting works; advertising, relations with foreign countries; to liquidate mass infestations of forest pests and diseases; to liquidate the consequences of natural calamities; to finance State Forest Inspection, Lithuanian Forest selection and Seed Breeding Centre, Forest Protection and Forest Seed Control

Stations; uniform system of state forest fire control measures; and other common forestry purposes.

**Forest fund planning**

Every year forest enterprises estimate forest fund for the coming year. This estimation is based on forest inventory projects, current state of forests, planned volume of forestry operations, financial standards (Mizaras 1995). Estimations are approved and investments controlled by the Ministry of Forestry. The remainder of resources is included into the forest fund of the next year. Shortage of means is covered from the centralised fund.

Harvesting income project for 1996 is presented in Table 5.

Table 5. Income (draft) in 1996

Stands	Volume, thousand m <sup>3</sup>	Average market price of timber volume assortments, Lt/m <sup>3</sup>	Income, thousand Lt
<i>Final cutting</i>			
Pine	204.4	150	30660.0
Spruce	952.7	108	102891.6
Oak	6.4	277	1772.8
Ash	8.7	187	1626.9
Birch	471.6	98	46216.8
Black alder	190.5	59	11239.5
Aspen	203.2	38	7721.6
White alder	41.1	35	1438.5
<i>Intermediate cutting</i>			
Different	1652.3	75.6	124913.9
Total	3730.9	88.0	328481.6

Projected income of forest enterprises for 1996 are compared with expenses in Table 6. Under projected level of prices forestry income covers expenses.

Table 6. Income and expense balance 1996, thousand Lt (draft)

Target	Sum thousand Lt	Percentage
1	2	3
<i>Income</i>		
Final cutting	203567.7	62.0
Intermediate cutting	124913.9	38.0
Total	328481.6	100
<i>Expense</i>		
Final cutting	85111.9	25.9
Intermediate cutting	94262.4	28.7
Afforestation	14249.6	4.4
Precommercial thinning	4058.8	1.2
Repair of ditches	2098.3	0.6
Sanitary protection	2073.7	0.6

Table 6. Continuation

1	2	3
Forest fire control	3225.0	1.0
Repair of roads	6360.2	1.9
Other expense	8333.3	2.6
Administration	56436.1	17.2
Investments and central fund	52272.1	15.9
Total	328481.6	100

**budget**

Causes

The necessity of financial support for forestry from state and municipality budgets is preconditioned by the following:

1. Forests produce not only wood but other products as well. Forests are significant for society as natural environmental factor.
2. Forest owner or manager under market economy conditions is not interested in afforestation or other operations generating products only after a very long period of time.
3. Consequences of greatly increased anthropogenic impact (withering caused by air pollution and pests, soil acidification) cannot be eliminated only by forestry investments.
4. Large areas unsuitable for agriculture must be afforested.

Legal prerequisites

The Act of the Lithuanian Republic foresees a possibility to finance forestry from the state budget. The government may provide subsidies and preferential credits for afforestation, regeneration, growing, fire prevention and sanitary protection as well as to develop forest infrastructure. If the activity of forest managers, owners or users is restricted, they receive tax and other preferences as well as compensations (section 8). Forest drainage works(except small - scale maintenance) are financed from the state budget (section 14). State forest inventory and account in private forests are carried out from state recourses, in other forests - it is financed from state, forest managers and forest fund (section 17). Forest enterprises and municipalities allot means for uniform fire prevention and extinguishing system in all forest holdings (section 21). Mass outbreaks of pests and diseases are localised and eliminated by means of state, forest managers, owners and forest fund (section 22).

The main trends

Compensation of forest exploitation losses in protected areas. In Lithuania protected areas cover 720.1 thousand ha (19.9% of the whole territory). A significant part of them comprise forests. At present forests with restricted economic activities cover about 600 thousand ha or over 30% of forest area (Karazija 1994).

Afforestation of agricultural land. Until the beginning of



land reform there were 120.2 thousand ha of land unsuitable for agriculture which should be afforested (Kenstavičius 1993). After land reform the area is supposed to increase. Unproductive land in Lithuania makes up approximately 10% (Kuodys 1996). It comprised 334.4 thousand ha on 1 January 1996.

**Compensations for forest owners.** Forest owners have losses and additional expenses due to: felling restrictions (felling prohibitions, greater felling ages, prohibited clear fellings); restrictions on free forest access (recreation, mushroom gathering, berry picking, etc.).

**Subsidies for forest owners:** to work out forest inventory projects, to establish and support organizational structures, to carry out forest economic measures, consultation and training.

### Financing standards

Felling prohibition in protected areas generates losses equal to the price of left standing volume.

Increased felling age causes losses due to postponed income. The losses are calculated by the following formula:

$$N = V - \frac{V}{(1+p)^t} \quad \text{or} \quad V \frac{(1+p)^t - 1}{(1+p)^t} = V * k$$

where:

$N$  - losses due to prolonged felling age;

$V$  - value of the stands volume;

$t$  - increase in felling age (years);

$p$  - interest rate (in parts).

When interest rate is 5% , then coefficient  $k$  is equal:

t	k
10	0.38
20	0.61
30	0.76
40	0.85
50	0.91

### Conclusions and suggestions

Essential economic changes of Lithuanian forestry in 1991 - 1995 were free timber sales, increase in timber prices, timber export, changes in financing, profit decrease, appearance of private ownership.

Forestry has to be financed from its income, replenishing it with subsidies from state budget. Standard forest fund planning method is suggested. It is based on projected extend of operations and income - expense standards. Lithuanian forestry at present is able to cover main expenditures from its income. The necessity of forestry financing from state budget is preconditioned by preservation of biodiversity and multiple forest usage, long forest growing period, negative consequences of

anthropogenic impact on forests, formation of private forestry. Primary trends of budget financing in Lithuanian forestry are: compensation of forest exploitation losses in protected areas, afforestation of agricultural land, compensations for forest owners. Financing standards were suggested.

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## Финансовые проблемы лесного хозяйства Литвы

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### *Резюме*

Определены экономические изменения в лесном хозяйстве Литвы за 1991-1995 г. А именно, свободная торговля древесиной; увеличение рубок леса, цен на древесину и экспорта древесины; динамика рентабельности лесного хозяйства; возникновение частной собственности. Лесное хозяйство Литвы финансируется из доходов от продажи древесины и других лесных продуктов (лесного фонда). При планировании лесного фонда применяется нормативный метод, который основан на проектных объемах лесохозяйственных работ и на нормативах доходов и расходов. Представлена проектная модель лесного фонда на 1996 г.

В Лесном законе Литовской Республики предусмотрена возможность дополнительного финансирования лесного хозяйства из госбюджета. В статье представлены причины определяющие необходимость бюджетного финансирования и основные его направления.

**Ключевые слова:** лесное хозяйство, финансирование, лесной фонд, бюджет, стандарты.