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**Ås**

# **Conceptual development of cost accounting of wood harvesting in the Republic of Karelia (Russian Federation)**

Olga Tyukina

Lic.Sc.(For.Econ), PhD student, University of Joensuu Faculty of Forest Sciences and External researcher, Finnish Forest Research Institute (METLA), Joensuu Research Unit, Finland  
e-mail:olga.tyukina@metla.fi

## **Abstract**

An improvement in cost accounting (CA) is one of the most important elements of the development of modern logging industry in Russia. CA of wood harvesting is important for management and decision making; it provides necessary information for choosing the optimal method of wood harvesting and for increasing profitability of business. The Soviet method of CA has a long history of development during the whole period of planning economy in Russia.

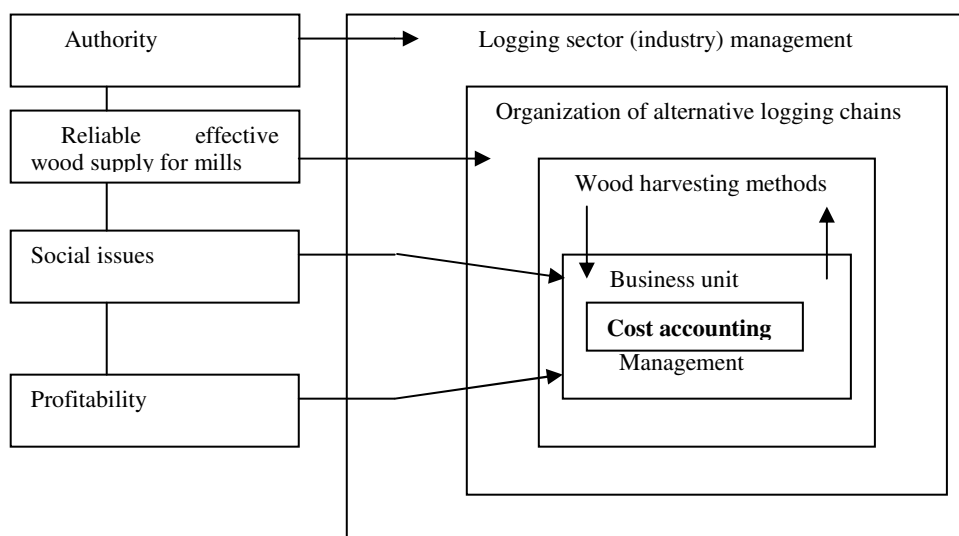
Nowadays the Nordic machines for wood harvesting play the important role in the Russian wood harvesting development. Cost per machine hour is the important factor for future development of CA in Russia. Nowadays, the Nordic CA method of wood harvesting is an alternative for traditional method. The Nordic approach has been promoted also by making textbooks and leaflets of the CA in forest work with international cooperation.

In this study the general points of Soviet/Russian CA method and Nordic CA method of wood harvesting cost calculation are compared. Both in the Soviet/Russian and Nordic methods wood harvesting costs are divided into fixed and variable costs. The most difference between these two methods is that exchange value of the new machinery is taken into account in the Nordic method, but not in Soviet/Russian method.

**Keywords:** wood harvesting, cost accounting, Russian and Nordic cost accounting methods

## **Cost accounting is a key element of Russian logging sector**

Cost accounting is the basic element of logging industry development (Fig.1). Cost accounting of wood harvesting plays a major role in management for the process of decision making. Cost accounting provides key information for choosing the optimal method of wood harvesting and increasing of business profitability.



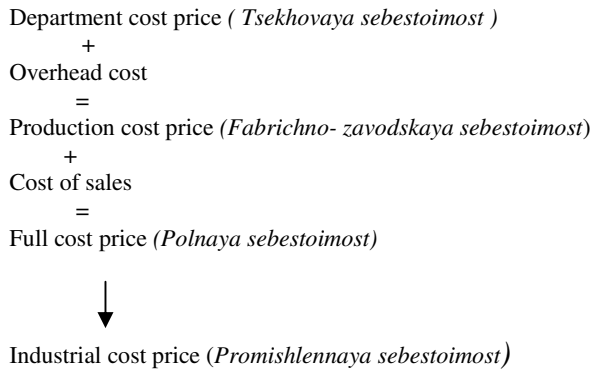
**Figure 1.** The economic elements in wood harvesting

The Soviet/Russian method and principles of cost accounting has been well developed for planning economy. The current domestic *Metodicheskie rekomendatsii po planirovaniyu, uchetu i kalkulirovaniyu sebestoimosti produktii lesopromishlennogo kompleksa (2003)* has been widely applied in Russia. In 2004, the general principles of Nordic method of wood harvesting cost accounting for Russian conditions were prepared at the Finnish Forest Research Institute (Sikanen et.al, 2004). Improved cost calculation processes for wood harvesting can contribute future wood harvesting to become more cost effective in Northwest Russia.

### **Russian cost accounting method in general**

The theoretical basis for Russian cost accounting is the Soviet theoretical approach of cost accounting. In the Soviet economy all costs of different types of activity and also cost of logging activity resulted from labour and social production costs (*obshchestvennye izderzki proizvodstva*). The value of commercial round wood was composed of labour and other social production costs. Social production costs consisted of three parts. The first part of social production costs was a value of means of production (*stoimost sredstv proizvodstva*); the second part of social production costs was the value of consumer's goods for itself (*stoimost tovara "dlya sebya"*), and the third part of social production costs was the value of consumer's goods for Soviet society (*stoimost tovara "dlya obshchestva"*). The cost price of commercial round wood for typical lespromkhoz during the 1950-1960s

years of Soviet period could be also calculated such the sum of the first and second parts of social production costs.



**Figure 2** Main cost price form in planning economy

The cost price had four forms (Fig. 2) that were applied on economic activity of typical lespromkhoz. The first form of cost price was the department cost price (*tsekhovaya sebestoimost*) includes the production cost of the given department for production. The second form of cost price was the production cost price (*fabrichno-zavodskaya sebestoimost*) which included all production cost and added overhead cost. The third form was the full cost price (*polnaya sebestoimost*) which was characterised by total sums of costs not only for production and added cost of the realisation of production. The fourth form was the industrial cost price (*promishlennaya sebestoimost*), which were depended both on the results of the work of the separate logging company, and from the organization of the production on branch as a whole. The cost price was distributed into individual and average industrial logging cost prices. Individual cost price was used for planning in one logging company. The general industrial cost price was the state average cost price. The industrial cost price was the background for price forming which used the products value.

In the USSR the cost accounting, cost price planning and cost price analysis was well developed and widely applied on the economic activity of typical logging companies. The process of cost accounting and cost price planning in logging industry means costs grouping by different economic indicators. There are 5 economic indicators and 10 economic categories were used in planning economy (Table 2).

**Table 2** Main economic indicators and classical categories

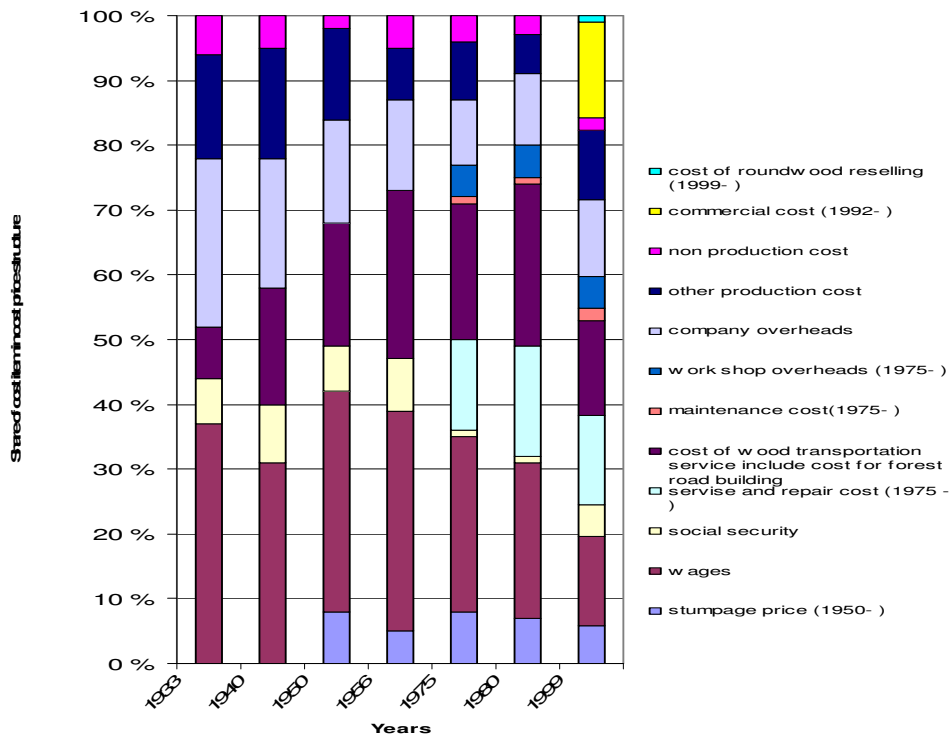
Economic indicators	Economic categories
1. Method of costs distribution	Direct ( <i>pryamiye</i> ) costs
	Indirect ( <i>kosvenniye</i> ) costs
2. Economic contests	Prime ( <i>osnovniye</i> ) costs
	Burden ( <i>nakladniye</i> ) costs
3. Total wood harvesting volume	Fixed ( <i>uslovno-postoyanniye</i> ) costs
	Variable ( <i>peremenniye</i> ) costs
4. Degree of generalization ( <i>stepen obobsheniya</i> )	Element ( <i>elementniye</i> ) costs
	Integration ( <i>kompleksniye</i> ) costs
5. Using time	Current year ( <i>tekushego perioda</i> ) costs
	Future periods ( <i>buduyushikh periodov</i> ) costs

Source: Chernousov and Sukhanovskiy (1959).

The cost value and distribution mechanism of social manpower were not well developed by the Soviet economic theory in regard to norm method. Sometimes higher costs price has been the basis for higher price. But high real cost were underestimated (long distance in wood transport). This lack of well developed mechanisms, during the period of socialist economy in USSR, has had significant consequences for the current state of national economy. Therefore, the higher of cost price has been the value and price of all goods. The subject of economic theory at the time was rather economic laws than well being of the population.

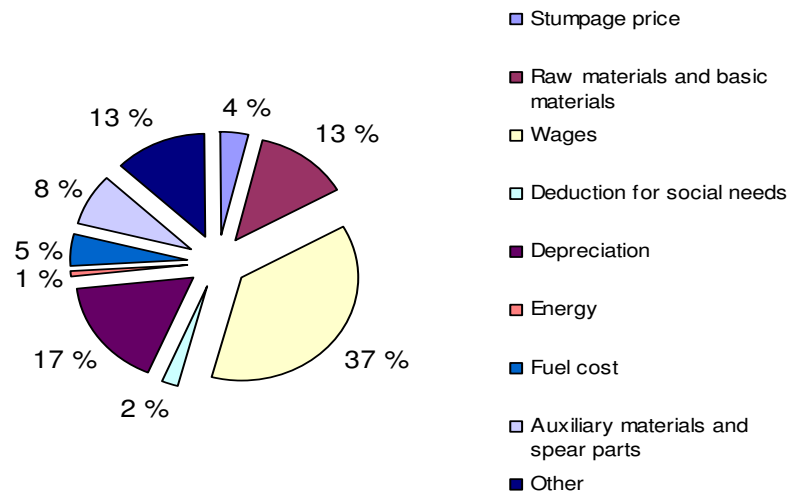
### **Concepts of industrial cost price accounting in planning economy**

The nomenclature structure of industrial cost price for logging industry from economic point of view means the spetcific weight of costs including the cost price calculation. Traditionally the industrial cost price are estimated on cost items (6-12) and cost elements (9) , (Fig.3). The cost items has been used for cost control and cost accounting of unit cost of commercial roundwood. The cost standard book (*smeta zatrat*) was a key document in the process of cost price accounting by item. The cost price classification by items was the general part of estimate. Traditionally the industrial or full cost price accounting by method of cost item listed was used for determination of the main calculation economic parameter such as actual (*fakticheskaya*) cost price.



**Figure 3.** Development of structure of cost items, according to the data of Chernousov and Sukhanovskiy (1959) for 1933-1956, Minlesbumprom USSR 1975 and 1980 in Petrov & Morozov (1984) and for 1999 by Styazhkin (2001)

Actual cost price has all attribute of objective truth of economic parameter used for operative management on logging companies and for Soviet taxation system. The quantity of cost items in cost price is changed. Theoretically there was a tendency to continuous simplification and reduction of quantity of cost items included in cost price structure, but in practice the quantity of cost items increased. The sum of total costs of whole lespromkhoz activity has been estimated as cost elements (Fig 4). In logging industry has been used the spetcific work quota for systematic cut of branch cost price duringmany decads of Soviet period. The key method of gradual raising of the rate of costs has been used for cost price accounting.



*Figure 4 Standard cost elements of industrial cost price for logging industry and they relative weight according data Minlesbumprom USSR 1980 modified (Petrov & Morozov (1984)).*

### **Changes in cost accounting during the became of market economy**

In the period of economic reform in Russia from 1992, the subject of economic theory was changed. In the Russian forest sector the current economic theory studies customers behaviour and production efficiency for pricing products, with a target of accessing maximum profit within the conditions of current limited forest resources.

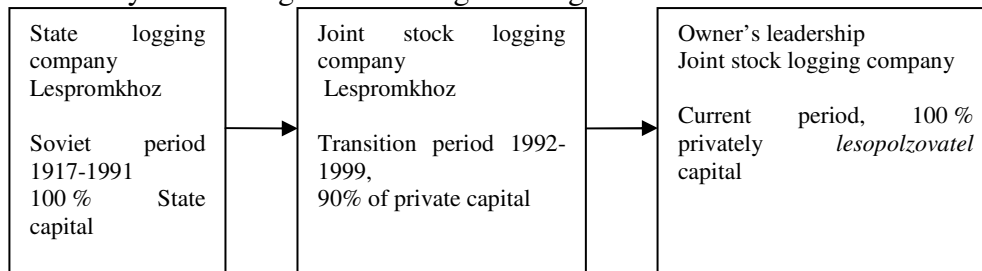
Transition period from 1992 to 1999, Russian model of market economy for whole Russian forest sector and especially for logging industry development was complicated and difficult. The idea of Soviet economic mechanism for full or industrial cost price cutting had been imperfect. Industrial cost price has been increasing continuously and Western methods of management accounting and financial accounting were not accepted by Russians logging industry economists.

During period of becoming (*stanovleniya*) market economy from 1999, the intensity of capitalization of logging companies has been increased (Fig.5).

For logging companies, especially in the Republic of Karelia, firstly were changed dominate method from traditional whole tree or tree-length method of wood harvesting to the cut-to-length. Secondly, logging companies have started to operate under a new forest owner's leadership (*lesopolzovatel*) status. In 2006, the main *lesopolzovatel* in the Republic of



Karelia was JHC “Karellesprom”. Thirdly, new models of Nordic machinery are coming to use through leasing.



**Figure 5.** Theoretical chain of a new role of logging company.

For Republic of Karelia conditions the most common leasing repaying scheme was as follows. The first payment in 2006 was not more than 25% of the machine purchase price, every quarter an equal sum is paid according to the leasing contract and also leasing interest more than 10% per every leasing year. In 2006 the share of leasing cost was 40% from wood harvesting costs for CTL method of wood harvesting, which using Nordic machinery. The depreciation costs have increased considerable. The current “attitude” to cost price has changed. The calculation parameter of factual cost price on logging companies has a character of top commercial secret and it is interpreted as a taxation attribute and has varies greatly in different logging companies. The quantity of cost elements in structure of industrial cost price has been decreased from 9 to 5, but quantity of sub-elements has been increased and costs become more integrated (Tabl.3).

**Table 3** Development of the order of cost elements in the structure of industrial cost price

Cost element structure since 1992	Integrated cost element structure 2003-2008
1. Stumpage price	Material costs
2. Raw materials and basic materials	<i>Materialniye raskhody</i>
3. Wages	2. Wages
4. Deduction for social needs	<i>Raskohody na oplatu truda</i>
5. Depreciation	3. Unit social tax
6. Energy	<i>Ediniy sotsialniy nalog</i>
7. Fuel cost	4. Sums of depreciation
8. Auxiliary materials	<i>Summy nachislennoy amortizatsii</i>
9. Other	5. Others
	<i>Prochiye</i>

The concept and general elements of Western market economy are currently having an increasing effect on the Russian economics theory. The

management accounting is one of the four approaches of modern Western cost accounting theories. The management accounting is the alternative of traditional method of cost accounting. From the economic point of view, the current strategy of large scale logging companies in the Republic of Karelia is the increasing of wood harvesting profitability. There has been a follow-up of the profitability of wood harvesting in Soviet Union and then in Russia since 1999. During the last five years wood harvesting has in general been unprofitable in Russia in period 2001-2005. The wood harvesting cost and price dependent demand limits the real economic capacity of harvesting. In reality many traditionally run Russian logging companies operating in the Republic of Karelia have not reached appropriate profit levels since the start of economic reform, and have thus suffered considerable operational losses. However, this situation has not followed the pattern of unfavourable market conditions. Due to the increasing demand of forests for alternative uses and products, which will limit harvesting volume, it is crucial for the Russian logging.

The current limitations on forest resources and harvesting in the Republic of Karelia require optimal harvesting technology and therefore more sophisticated methods for cost calculation. Now with Nordic technology the capital cost is that high that profitability depends on harvesting volume. In practise, the current harvesting cost distribution into fixed cost and variable cost still has some elements of the characteristics and rating factors from the previous system used during Soviet times.

### **Development of Nordic cost accounting method for wood harvesting**

Nowadays the Nordic machines for wood harvesting play the important role in wood harvesting development. Cost per machine hour is the important factor which need used for wood harvesting cost calculation and for cost price calculation. The Western approaches have been promoted also by making textbooks and leaflets of the cost accounting in forest work with international cooperation (Sikanen et al. 2004, Ananyev et al.2005).

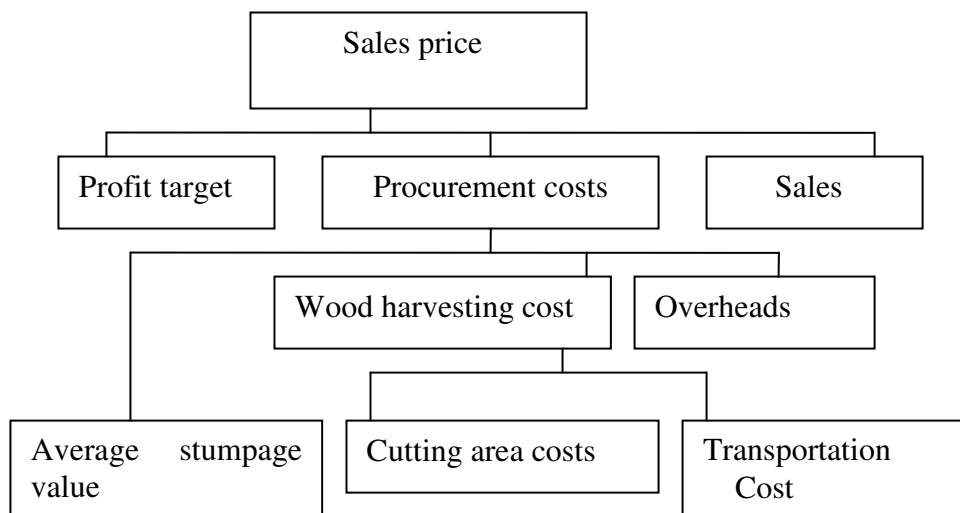
**Table 4** Some differences in cost accounting of wood harvesting between domestic and Nordic CA methods

Domestic cost accounting method	Nordic cost accounting method
Three-length method of wood harvesting and domestic machinery have been applied	Cut-to-length method of wood harvesting
Domestic machinery and common form of logging work organization was <i>kompleksnaya brigada</i> and one working shift	New Nordic machinery for logging companies in Russia
7-hours working shift in cutting area	Working team and 24-hours working in cutting area

Source: Tyukina 2000, 2001, 2004 and 2007

The methodical concept of sales price accounting for independent logging companies can be described such as the “tree of costs” (Fig.6) form consisting of three cost levels. The first level of costs includes the cutting area costs, round wood transportation costs and average stumpage value. Cutting area costs is the total costs of round wood harvesting on cutting area. Transportation costs is a costs of round wood transportation from roadside terminal or upper landing to lower landing and than to mill gate or directly to mill gate. Average stumpage value is a specific cost included two types of payments. The first part is the payment of value for commercial wood that was used for wood harvesting. The second part is reflected the value of forest land through the forest rent in the form of tax rate for rent of forest land.

The sum of cutting area costs and round wood transportation costs form the second level of costs so called wood harvesting cost. Overheads, wood harvesting cost and average stumpage value form the procurement cost.



**Figure 6.** The general framework of cost and sales price accounting for new independent logging company.

Cost of sales can be established on the third level and calculated as a total sum of costs, which arise during the sales of short round wood to customers. The sum of procurement costs, costs of sale and profit target form the sales price.

## Conclusions

- Nordic method of wood harvesting cost accounting is necessary element for economic terminology development and bringing together Western and Russian views in forest economics.
- Soviet cost accounting has a specific status in the history of cost accounting in the World.

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