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**NOTIONS ON FOREST SECTOR  
OF THE REPUBLIC OF KARELIA**  
(on the official data and results of a questionnaire study)



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## ANNOTATION

Official information, results of scientific research and questionnaires on urgent development problems of the forest sector of the Republic of Karelia carried out in 2002–2003 by experts of the Petrozavodsk State University and the Institute of Economy of Karelian Science Centre of the Russian Academy of Sciences are presented in the book.

118 professionals from forest industry enterprises of the Republic of Karelia, Forest Service of the Department of the Ministry of Natural Resources of the Russian Federation on the Republic of Karelia, local administrations, as well as 88 elder students of Karelian universities have taken part in the questionnaire study.

Notions on forest sector among participants of the questionnaire study have been analysed. The attitude to the problem of changing forest ownership, as well as prospects of different kinds of forest use in Karelia have been discovered among representatives of forest business and state bodies. Requests, which the long-term leasers of forest sites should meet, have been revealed.

The attitude of state forestry enterprises' employees to problems of conservation of old-growth forests covering about 7 % of the total forest area of the Republic of Karelia, have also been explored.

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### Used abbreviations:

Federal Forest Service	State Forest Service of the Ministry of Natural Resources of the Russian Federation
Forest Service of Karelia	Department of the Ministry of Natural Resources of the Russian Federation in Karelia
Petrozavodsk University	Petrozavodsk State University
Institute of Economy	Institute of Economy of the Karelian Science Centre of the Russian Academy of Sciences

## CONTENTS

1. Introduction .....	5
1.1. Background .....	5
1.2. Aim of the study .....	6
2. Material and methods .....	7
2.1. Questions .....	7
2.2. Respondents .....	8
3. Theoretical framework .....	9
3.1. Rich forests .....	9
3.2. Culture .....	11
3.3. Forestry education .....	12
3.4. Enterprises of forest sector .....	13
3.5. Standard of living .....	15
3.6. Problem of forest resource ownership .....	16
3.7. Forms of forest use .....	17
3.8. Problem of choosing effective forest users .....	18
3.9. Problem of forest conservation .....	19
4. Results .....	20
4.1 General notions on forest sector .....	20
4.2. Opinion on forest resource ownership .....	31
4.3. Notions on the development of forest use .....	33
4.4. General notions on forest users .....	34
4.5. Notions on forest conservation .....	35
5. Conclusion .....	39
Literature .....	43
Annex .....	47

## 1. INTRODUCTION

*Forest sector – branch of economy, intended for satisfaction of diverse human requirements in forest production. Forest sector includes wood harvesting, mechanical woodworking, pulp and paper enterprises, enterprises of printing industry, silviculture, power supply, as well as forest machinery plants, transport, forest science and education [23].*

### 1.1. Background

Main feature of the Russian forest sector is state ownership on forest resources, which are managed by the state Forest Service of the Ministry of Natural Resources of the Russian Federation (later Federal Forest Service). Other part of the Russian forest sector is privatised forest industry complex, including wood harvesting, woodworking and pulp and paper enterprises.

Forest industry complex plays a leading role in the industry of the Republic of Karelia (RK) and is controlled by the state Committee of RK on forest and mining industry complex. The Government of RK carries out policy of market transformations in the forest sector consistently. The main problem is ensuring balance between interests of various state departments and bodies and forest users, in order to secure development of Karelian economy and sustainable multi-purpose use of forest [21]. Target, and a great challenge of the policy is to increase the value of final forest products from 58 up to 175 USD per 1 m<sup>3</sup> of harvested wood in Karelia [25].

Another important problem of Russian, as well as Karelian forest sector is the transition from the exclusive state ownership of forest resources to a diversity of forest ownership forms within the frameworks of the Constitution of the Russian Federation [34, 35] and the new Forest Code expected to become to force during 2004. In addition, one significant problem in Karelia is conservation of old-growth forests situated next to the main channels of round wood export to the Western Europe. Also, contradiction between development of timber harvesting and nature tourism in Karelia can be detected [14].

As mentioned in the definition above, forest sector has connections with many branches of economy. In addition, forests are a significant part of life in the boreal coniferous zone, where forests are present everywhere and almost everyone has some kind of relationship with it. Forest conception within different kinds of stakeholders is important to realise in order to set aims for development projects and participatory planning of forest operations and politics.

### 1.2. Aim of the study

The development of the forest sector of Republic of Karelia requires information about different interest groups and stakeholders.

This study concentrates to identify differences in opinions and attitudes towards the defined topical issues within professionals from the local Department of the Ministry of Natural Resources of the Russian Federation (later Forest Service of Karelia), local authorities and forest harvesting enterprises, as well as students-activists from Karelian ecological Non-Governmental Organizations and elder students of forest specialities. By the results, future perspectives and critical issues in the development of the forest sector will be discussed.

Presented results of the questionnaire studies can be utilized for improving the policy and strategy of the Government of RK in the fields of forest use and development of Karelian forest industry for the long-term period.

## 2. MATERIAL AND METHODS

### 2.1. Questions

The questionnaire study consists of five themes studied. First theme was devoted to identifying opinions, as well as differences in them concerning general concept of forests and their meaning among the present and future forest authorities and specialists. Four themes were exploring more detailed questions about the topical issues in the Karelian forest sector among the authorities and forest users.

#### 1: *General notions on forest sector*

The theme included five blocks of questions: «Rich forests», «Culture», «Forestry education», «Enterprises of forest sector», «Standard of living» (Annex 1). Blocks were formulated and named in order to divide forest sector and related features into groups, which help in creating thinking patterns. Reasoning of the blocks is presented in the later parts of this chapter.

Each participant was asked to choose within 5 answers: «completely agree», «agree», «disagree», «completely disagree», «don't know». Only one answer was allowed. If 2, more or no alternative was chosen, answer was equated to the alternative «don't know».

#### 2: *Opinion on forest resource ownership*

Each respondent was asked to fill in the questionnaire containing six questions concerning preservation of state forest ownership, and possibility to introduce private, regional administrations' and other ownership forms of forests (Annex 2).

First five questions required choosing between three answering alternatives: «agree», «disagree» and «don't know». Only one answer was allowed. If 2, more or no alternative was chosen, answer was equated to the alternative «don't know». In the last question it was asked to evaluate the offered alternatives according to their significance giving each alternative a per cent value. Respondents could give to any alternative 0 %, but the total sum should remain equal to 100 %.

#### 3: *Notions on the development of forest use*

The question was presented as a list of different forms of forest use, where each respondent was asked to evaluate possible forms by giving each alternative a per cent value according to their significance. Respondents could give to any form 0 %, but the total sum should remain equal to 100 %.

#### 4: *General notions on forest users*

The theme was formed into a list of criteria and qualities of forest leaser, for example amount of processed wood in different conditions, sustainability of activities and economical situation of the enterprise.

Each respondent was asked to give points to the listed criteria according to their significance for a long-term forest leasing. Respondents could give to any sub-criteria 0 points, but the total sum should remain equal to 100 points. Checking the homogeneity of results by criterion  $\chi^2$  was carried out. Experts drastically differing from others in their answers (4 %) were identified by «nearest neighbour» method of hierarchical cluster analysis and by «correlation galaxies» method [3, 36].

#### 5: *Notions on forest conservation*

The theme consisted of 13 questions concerning status and future of forest conservation, activity of NGO, ecological policy and harvesting practises.

All questions required choosing within 5 alternatives: «completely agree», «agree», «disagree», «completely disagree», «don't know». Only one answer was allowed. If 2, more or no alternative was chosen, answer was equated to the alternative «don't know». Results of the questionnaires were processed by methods of mathematical statistics [3, 36].

### 2.2. Respondents

Respondents represented five groups of forest sector's actors, professionals from the Forest Service of Karelia, local authorities and forest harvesting enterprises, and students-activists from Karelian ecological Non-Governmental Organizations and future employees of the forest sector - elder students of forest specialities (Table 1). Totally 114 persons took part in the study.

Professionals of the Forest Service of Karelia represent the forest management units "leshoz" and are working as foresters or forest engineers. Representatives of the local authorities and forest harvesting enterprises are working as directors or chief specialists. All these stakeholders are involved in the process of forest resources' use. Participated enterprises represent large sized companies.

Table 1. Information about the respondent groups.

Respondent group	Number of respondents by answered themes					Average work experience, years	Average age, years
	1	2	3	4	5		
Forest management (FM) professionals from the Forest Service of Karelia	26	31	31	31	26	9,6	33,0
Representatives of the local authorities (LA)		32	32	32		9,8	45,4
Representatives of forest harvesting enterprises (FH)		29	29	29		21,1	43,7
NGO activists	21					3,0	21,5
Students of the speciality "Forest engineering (FE)"	37					4-5 year studies	21,5
Students of the speciality "Silviculture (SI)"	30					4-5 year studies	21,5

Themes:

- 1: General notions on forest sector, 2: Opinion on forest resource ownership, 3: Notions on the development of forest use, 4: General notions on forest users, 5: Notions on forest conservation

All questionnaires were carried out in 2002–2003 by experts of the Petrozavodsk State University (later Petrozavodsk University) and the Institute of Economy of the Karelian Science Centre of the Russian Academy of Sciences (later Institute of Economy). Results of the questionnaire were processed by methods of mathematical statistics [3, 36] and are authentic.

### 3. THEORETICAL FRAMEWORK

#### 3.1. Rich forests

The area of forest fund of the Republic of Karelia is 14.5 million ha, or 82 % of the total area of the republic, including forested lands 9.2 million ha. Average annual increment is 13.6 million m<sup>3</sup> [13]. Most valuable coniferous species are prevailing in the tree species composition (Figure 1). Growing stock is 910.38 million m<sup>3</sup> (Figure 2). In comparison with 1993, the total area of the forest fund has decreased 243 thousand ha, but area of forested land has increased 251.3 thousand ha (2.8 %).

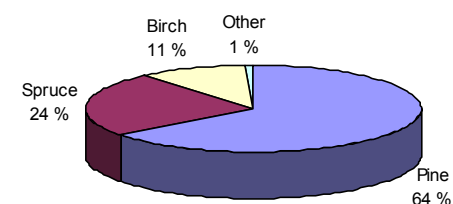


Figure 1. Share of tree species in Karelia.

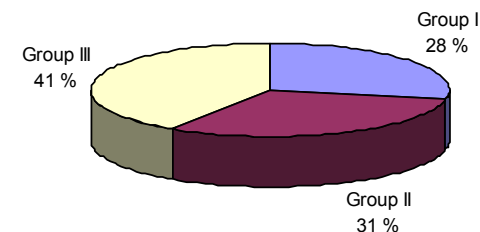


Figure 2. Use categories of the growing stock.

Annual allowable cut of final fellings is 9.3 million m<sup>3</sup> and annual harvest rate in 2003 was 66.4 %. Removal from 1 ha of forested land is 0.72 m<sup>3</sup>, which is higher than in Russia on average (0,13 m<sup>3</sup>), but for example 4 times less than in Finland. Annual increment per 1 ha is more than 3 m<sup>3</sup> in Finland, in comparison with 1,5 m<sup>3</sup> in Karelia. [13, 25].

Age structure of Karelian forests is highly non-even (Figure 3), that hinders organizing sustainable final fellings. One can say, that in the long-term annual allowable cut of final fellings will be reduced approximately 3.5 times, that requires development of intermediate fellings in Karelia [22].

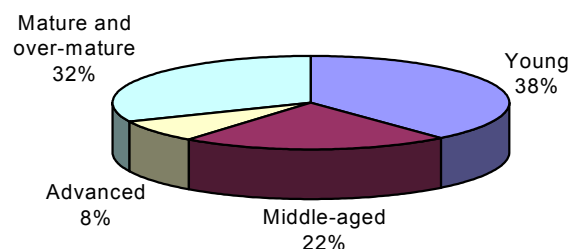


Figure 3. Share of development classes of the Karelian forest fund.

Annual allowable cut of intermediate fellings (thinnings, sanitary fellings, reconstruction fellings, re-newing and re-forming fellings) is 2.4 million m<sup>3</sup> in Karelia. Economically valuable annual allowable cut of intermediate fellings is 1.8 million m<sup>3</sup>, actualised cut less than 25 %. Appropriate volumes of road construction would allow increasing actualised cut of intermediate fellings up to 55 % [14, 22].

### 3.2. Culture

Culture (including ecological one) demonstrates its contents through the system of values, norms, traditions, knowledge, etc. [23]. The theme of nature conservation has not become a part of modern Russian culture. Moreover, Russian (including Karelian) public opinion shows indifference to this theme and even rejects it [11].

In the XX century Karelia, as well as whole Russia, has experienced internal migration of the population. Karelia has a significant amount of «incoming» population, which incline to represent forest as a place of temporary earnings or exile, not as their «native land». The model of «heroic work» based on nature's transformation spreaded by the «official» Soviet culture significantly destroyed the local people's traditional culture, closely connected to forests [11].

Moreover, the alienation of people from the property on forest and other natural resources results that people do not perceive forest and its problems as their own concern [23].

Nevertheless, the Karelian community perceives positive aims of traditional culture, realizing value of forest as a recreational place and mean of ethical and aesthetic upbringing for their children [6]. Nature-protecting ideas are gradually rooting into Karelian public consciousness. In particular, this expansion is expressed in such novelty as the term «sustainable forestry» instead of the Russian term «continuous, non-exhaustive multi-purpose forestry», which essence is exactly the same [11].

Activities of the state bodies of culture, development of peoples' cultural and leisure activities are financed from the budget of the RK as well as from budgets of large Karelian industrial enterprises [9]. The special positions in cultural development in Karelia have Kondopoga and Segezha, where large pulp and paper mills are situated. For example, sport palace, concert hall and other remarkable culture objects of Karelia have been built in Kondopoga by pulp and paper mill «Kondopoga». The level of culture in forest settlements essentially differs from towns of Karelia. That is connected with sharp reduction of the state financing of social services in the post-Soviet period.

Quantity of employees engaged on social and cultural services has been significantly reduced, for example in one of the Karelian forest settlements from 400 to 2 persons. Culture clubs were liquidated in some settlements. The main reason is the substantial financial dependence of cultural services from wood harvesting enterprises, majority of which is low profitable or even unprofitable [9, 26].

### 3.3. Forestry education

Specialists of the Karelian forest sector have high level of education (Table 2) [14]. The Karelian forest sector can hire graduates of from Russian forest universities, preparing professionals of 10 engineering and economic specialities. Graduates of the Forest Engineering Faculty of the Petrozavodsk University are dominating among the managers and engineers of the Karelian forest sector. Petrozavodsk Forest Technical College prepares technical staff (foremen, harvesting masters) for the Karelian forest sector. Qualified workers are also prepared by Karelian technical schools, as well as by Forest technical school.

Research for the Karelian forest sector is implemented by the Petrozavodsk University, Institute of Economy, Forest Institute of the Karelian Research Centre, Karelian Research Institute of Forest industry Complex, as well as by research departments of JSK «Onega Tractor Plant», JSK «Petrozavodskmash»

and some other Karelian enterprises of forest machinery.

Table 2. Share of higher education among employees of the Karelian forest sector.

Occupation	%
Chief engineers and foresters	78
Harvesting engineers and foresters	40
Harvesting foremen and assistants of foresters	30
Employees of economical and marketing departments	25

Main fields of scientific research in the Karelian forest sector are:

- Research and developing new technologies of use, protection and renovation of forest resources;
- Developing rational technologies for processing forest products on the basis of resource-saving principles;
- Research in the field of economy and development of automated managing systems for different branches of the forest sector.

### 3.4. Enterprises of forest sector

Forest industry complex of Karelia makes near 45 % of all industrial product of the republic. In 2002 the Karelian forest industry complex produced 20 % of all Russian paper [13, 25]. There were 515 enterprises (56 % small enterprises, 23 % departments of non-industrial organizations, 21 % large and middle-sized enterprises) in the Karelian forest industry complex in 2002. More than 97 % of the forest industry enterprises are privatised (Table 3). There are 27 forest management units (*leshoz*) in the property of the Forest Service of Karelia [13, 14].

42 700 persons (51,9 % of all industry labour in Karelia) worked at enterprises of the forest industry complex in 2002 and 3 093 persons in the Forest Service of Karelia. During 1998–2002 production volume of the forest industry complex increased 43.7 % (Table 3). At the same time, production of sawntimber has decreased almost 3 times (in 2004 720.8 thousand m<sup>3</sup>), production of fibreboards and skis is terminated, and production plywood has decreased 5.5 times (from 123 to 22.1 thousand m<sup>3</sup>). In 2002 enterprises of the Karelian forest industry complex made products on the total sum of 15,6 milliard roubles (Table x). The costs per 1 rouble of production were 0,87 roubles in 2002, which is 0,09 RUR higher than in 2001.

Table 3. Characteristics of the Karelian forest industry complex in 2002.

Branch	Production volume change %	Net profit, mill.rbl	Worn-out of production capital	State ownership, %
Whole forest industry complex	0,1	667,8	32,7	
Woodworking industry	10,8	- 177,4	25,7	5,8
Pulp and paper industry	0,5	684,8	27	7,6
Wood harvesting	-4,6	160,4	55,7	18,3

The worn-out of production capital of the Karelian forest industry enterprises was on average 33 % in 2002 (Table 3) [13]. During 1991–1999 production capital of the pulp and paper industry decreased 23.7 %. At the same time, production capital of the woodworking industry decreased 37.2 %; including 54.7 % decrease in the furniture industry and 31.3 % decrease in the sawmill industry [14]. There has started a renovating process of production capital. 1,7 milliard roubles were invested into Karelian forest industry in 2002 (66.5 % of all investments into the Karelian industry).

In 2002 the Karelian forest industry complex exported products worth 378.8 million USD, 64.4 % of all Karelian export. 77 % of the forest industry products have been exported. Round wood took most significant share (63.9 %) of the exported products. At the same time, more value-added production capacity is not fully exploited in Karelian wood processing enterprises. For example, JSK «Segezha pulp and paper mill» could annually process 2.5 million m<sup>3</sup> of round wood, but processed only 1 million m<sup>3</sup>, pulp and paper mill JSK «Kondopoga» 2.5 and 1.6 million m<sup>3</sup> respectively [25].

Existing Russian tax system, encouraging round wood export from Karelia, as large part of surplus value is re-directed into the federal budget as taxes and customs duties, aggravates the problem. At the same time, round wood importers are maintaining high prices (it is possible to say redundantly high in comparison with prices of Russian domestic market), in order to support this situation [35]. Thus, development of timber processing within Karelia demands increasing customs duties for round wood, in order to significantly reduce its export from Russia [21, 22].

In 2002 the 27 forest management units (*leskhoz*) of the Forest Service of Karelia used 303,4 million roubles for silviculture in 2002, including 197,1 million roubles from *leskhoz* own means in addition to the budget funds (Table 4). 6.2 million m<sup>3</sup> of forest stock were sold to harvesting enterprises for 269.1 million RUR (annual allowable cut of final fellings is 9.3 million m<sup>3</sup>).

Table 4. Silvicultural activities carried out in Karelia in 2002.

Activity	ha
Planting	6 028
Sowing	2 014
Assisted natural regeneration	13 433

Increasing utilization level of the annual allowable cut requires development of road construction [22]. According to «Karellesprom», annual rate of forest road construction and reconstruction should be 800 km, while only 167 km has been built in 1999. In the 1990s the average annual construction rate was even less than in 1999 [29]. The main reasons of the current situation are the practice of awarding forest sites only for the short-term lease [29] and positions of the forest legislation, restraining economical interests of forest users. For example, forest users are obliged to transfer built forest roads to the forest management units (*leskhoz*es) of the Forest Service without any reimbursement [12]. However, road construction costs are liable to taxation, what is additionally restraining development of the forest road network.

### 3.5. Standard of living

**Standard of living** – parameter, quantitatively measuring satisfaction of personal needs through wage rate, volume of consumption, etc. Parameter can be measured using objective (based on official statistics) and subjective (based on sociological questionnaire) evaluations [8].

Influence of the forest sector to the standard of living in Karelia is determined by quantity of the sector's employees (more than 50 % of all engaged in the Karelian industry) and community-forming role of the sector's enterprises (178.8 thousand persons or 22.4 % of all the Karelian population are living in the forest settlements) [13, 14].

Maintaining simple reproduction of population requires wage rate allowing employees to support their ability to work and to keep one child – future employee [16]. Thus, average monthly wage should twice exceed average minimum of monthly costs of living. Hence, average monthly wages offered by the Forest Service, the wood harvesting industry and the mechanical woodworking industry did not provide simple reproduction of employees (Table 5). It can be confirmed by reduction in the Karelian population (in 2002 birth rate was 9.6 persons per 1000 persons, while death rate was 17.8 persons per 1000 persons), decrease in labour productivity in wood harvesting industry (2,5 times in comparison with the year 1990) and increasing average age of forest industry workers [9, 14, 40].

Table 5. Average minimum of monthly cost and wages in 2002 [9, 13].

Employer	roubles/month
Average minimum of monthly cost of living	2 054
Forest Service of Karelia	4 091
Wood harvesting	3 937
Mechanical woodworking industry	3 159
Pulp and paper industry	5 938

The standard of living in the Karelian forest settlements became lower, due to staff reduction in the forest sector in the 1990s. Transferring of social infrastructure from forest industry enterprises to ownership of local administrations has aggravated this process as these administrations have lack of financial resources [8, 14, 26]. Houses in the Karelian forest settlements are lacking modern comforts and considerably worn out. Share of pensioners is increasing in the population of the forest settlements [8, 26].

High unemployment and low wages compel population of the forest settlements to search additional sources of income. People of the Karelian forest settlements run self-sufficient economy and pick up non-timber forest products for sale. Role of income from non-timber forest products is quite significant for rural people in comparison with their wages. During summer and autumn employees leave their work places in enterprises, in order to pick up mushrooms and berries [26]. For example, according to the data of the Karelian ecological NGO «SPOK», 3 thousand tons of berries are annually picked up in the vicinities of Pudozh. This provides annually extra-income of 40 thousand RUR for 1.5 thousand rural people (15 % of Pudozh population).

### 3.6. Problem of forest resource ownership

Main feature of the transition period of Russian economy is the state ownership of forest resources while enterprises of forest industry have already been privatised. Russian tax system encourages round wood export from Karelia as large part of new surplus value is in this case re-directed into the federal budget (as taxes and custom duties). In case of developing timber processing within Russia, large part of new surplus value will be assumed by private wood processing enterprises.

Possibilities of private enterprises to derive more profit by increasing the number of employees or use of natural resources are practically zero in developed capitalist countries. Thus, the main method of preserving and increasing their capital is by capturing and exploiting resources of other countries.



Therefore, round wood importers are keeping high prices (it is possible to say redundantly high in comparison with prices of the Russian domestic market) in order to support the current situation in Russia [35].

Thus, the main precondition for the sustainable socio-economic development of Russia is the transition from the exclusive state ownership of forest resources to a diversity of forest resource ownership forms within the frameworks of the Constitution of Russian Federation [25, 34, 35]. The optimum scenario for the diversification of forest resource ownership forms may be as follows: transferring resources from the ownership of the state into ownership of federal subjects – leasing of forests to large-scale enterprises – transferring of resources into private ownership of large-scale enterprises on the basis of closed privatisation of leased forests [25, 35].

The analysis of the situation allows making a conclusion that transition to the diversity of forest resource ownership forms will inevitably be carried out in Russia. For example, the federal law «On the Circulation of Agricultural Lands», 27.01.2003, already assumes private ownership of agricultural lands as a means of production. Also, the discussed draft of the new federal Forest Code legalizes private ownership of forest resources [18].

At the moment, the development of timber processing within Karelia demands increasing customs duties on round wood, followed by significant reduction of round wood export from Russia [21, 22].

### 3.7. Forms of forest use

According to the Forest Code [12], there exists following forms of forest use: wood harvesting, resin collection, collection of secondary forest resources, hay-making, cattle grazing, beekeeping, industrial collection of sap, berries, mushrooms, medical plants, technical raw materials etc., using forests for hunting, using forests for research purposes, using forests for cultural, health-care, tourist and sports purposes (article 80).

Wood harvesting is dominating in Karelia. Annual allowable cut of final fellings in Karelia is 9.3 million m<sup>3</sup> (66.4 % harvested in 2003). Economically valuable annual allowable cut of intermediate fellings is 1.8 million m<sup>3</sup> (less than 25 % harvested). Main reasons hindering the development of intermediate cuttings are the lack of forest roads, limited saleability and low price for wood from intermediate fellings, high costs of intermediate fellings and lack of workers [13, 14, 22]. It is possible to increase the volumes of intermediate fellings by making the Karelian Government more active in transferring forests into long-term lease to large-scale wood processing enterprises [25, 35]. At the same time, Karelian forests are rich in non-timber resources such as berries, mushrooms and medical plants (Table 6). [14].

Table 6. Annual production of non-timber forest resources in Karelia.

	Growing stock, tons	Economically valuable growing stock, tons
Berries	120 400	61 800
Medical plants	10 500	6 300
Mushrooms	164 400	65 600

It is necessary to note that according to the Forest Code, forests can be simultaneously given to utilization for one or several forms of forest use [12]. In Karelia contradictions have occurred between using forests for wood harvesting and tourist purposes, as well as between wood harvesting and establishing protected areas [14]. Solving contradictions between different forms of forest use [39] is carried out by the Karelian Government on the basis of recommendations made by experts of the Karelian Research Centre.

### 3.8. Problem of choosing effective forest users

Nowadays the total area of leased forests is near 64 % of the Karelian forest fund. Annual allowable cut of final fellings for leased forests is 5.9 million m<sup>3</sup> that is 66.4 % of the total annual allowable cut of final fellings. In the end of 2004 short-term lease contracts of forests (5 years) will be over in Karelia and long-term lease of forests (up to 99 years) will be started in 2005 by carrying out special forest auctions [21, 22, 25].

Strategic goal of the development of the Karelian forest industry is increasing the value of final forest products from 58 up to 175 USD per 1 m<sup>3</sup> of harvested wood [25]. One way of achieving this objective is transferring Karelian forests into long-term lease, which allows to overcome the contradiction between the state forest ownership and private ownership on means of wood processing [25, 35]. It is necessary to note that transferring forests into long-term lease on the basis of forest auctions carried out by the forest management units (*leskhoz*s) together with local administrations, according to the Forest Code (articles 43–45), 3.02.1997 and Decree of the Federal Forest Service of Russia № 99, 11.08.1997 [5], is optimal for the transition period.

The forest auctions carried out in Russia and Karelia brought out the following shortages in their execution [19, 24]:

- Unjustified lobbying of regional administration by local enterprises to grant admissions to participate in the auctions;
- Allowing participation in auctions of enterprises having no own resources to carry out forest use;

- Awarding lease rights to enterprises having no own resources to carry out forest use, which encourages illegal subleasing of forests;
- Awarding lease rights to enterprises ignoring forest road construction on leased forests;
- Awarding lease rights to enterprises suffering from financial problems or ignoring tax and other obligatory payments;
- Awarding lease rights to enterprises violating the forest legislation.

Observed shortages are caused by the absence of a technique to select the participants of forest auctions. Nowadays, decision making on granting admissions to participate in forest auctions is based on non-formalized set of criteria [17, 21]. This practice promotes reducing prices in forest auctions, and awarding lease rights to forest users not interested in sustainable forest use and wood processing. Therefore, formalization of the procedure of selecting forest auction participants is an urgent problem [5].

### 3.9. Problem of forest conservation

Conservation of old-growth, i.e. climax and virgin forests situated next to the main channels of round wood export to the Western Europe has become an urgent problem in Karelia. Total area of the Karelian old-growth forests is about 7 % of the area of Karelian forest fund [7, 15, 32, 37].

Karelian old-growth forests are situated along the Russian-Finnish border, in Pudozh administrative district, on Karelian part of the White Sea shore and in the central part of the republic. Most of these forests are not protected and being intensively harvested [7, 37]. Some part of Karelian old-growth forests is included into nature protection area system. Total area of the Karelian nature protection area network is 0.8 million ha (4 % of the republican territory), however full interdiction of wood harvestings is in force only at the half of these area, in nature reserves, national parks and several other protection areas [32, 37]. For example, nature protection area with full interdiction of wood harvestings covers 4.3 % of the Murmansk region and 9.7 % of the Republic of Komi. Only Arkhangelsk region has the same area of these protected territories as Karelia [37].

Current situation became the basis of NGO requests to the Karelian Government to stop cuttings in Karelian old forests not included into nature protection area system with full interdiction of wood harvestings. As a positive result, the request of the Karelian Government to the Government of the Russian Federation on creation of National Park «Kalevalskiy» should be mentioned.

## 4. RESULTS

### 4.1. General notions on forest sector

Results of the questionnaires are presented in Annex tables A.1...A.5. Consideration of results' homogeneity by criterion  $\chi^2$  has shown that it is impossible to accept the hypothesis of homogeneity of all four answering groups for each question (reliability level 0.9) [3, 36]. **Thus, each group has own general notions on the forest sector of RK.**

As a whole, closest answers were given by students of forest engineering and silviculture and farthest by NGO activists and forest management professionals. Also, answers of forest management professionals considerably differ from answers of other groups.

**1<sup>st</sup> block «Rich forests»** (Annex table A.1). More than 60 % of the respondents consider, that Karelian forests are polluted (question № 1, Figure 4). At the same time, they suppose that Karelian forests makes high quality raw material for sawmill and pulp and paper industry, produce pure berries and mushrooms and create safe surrounding for tourism (questions № 6, 7, 11, 12, Figure 5).

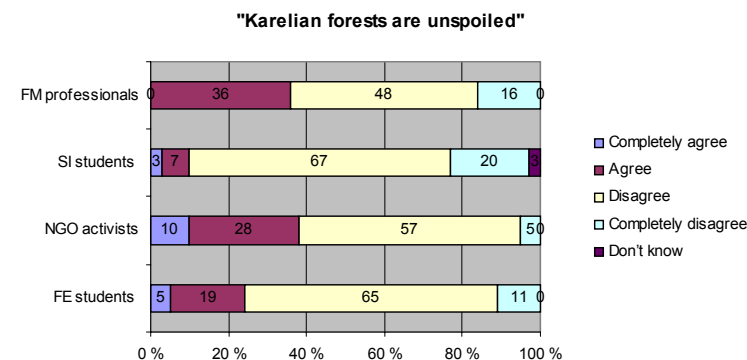


Figure 4. Answers to question about the state of forest resources.

**"Berries and mushrooms of Karelian forests are pure and safe to eat"**

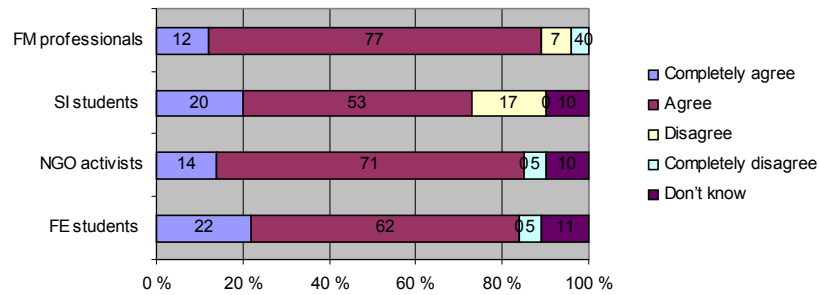


Figure 5. Answers to question about the state of forest resources.

More than 70 % of students of forest engineering and silviculture believe that Karelia has vast forests (question № 2, Figure 6). However, opinions of forest management professionals and NGO activists, closely acquainted with the current situation, have divided approximately half.

**"Karelia has vast forests"**

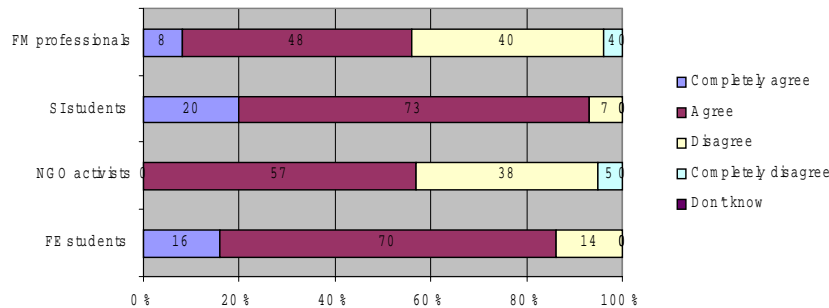


Figure 6. Answers to question about the forest resources.

More than 70 % of students of forest engineering and forest management professionals believe, that biodiversity is the basic principle of the Karelian forestry (question № 3).

More than 70 % of the respondents agree that citizens of the Karelian forest regions earn their income working in forests, including picking up berries and mushrooms (questions № 4, 5, Figure 7). But, more than 50 % of the respondents deny, that processing berries and mushrooms to be sold in the international markets provides a great amount of jobs and income for the citizens (question № 10).

**"Citizens of Karelian forest regions earn their income working in the forest"**

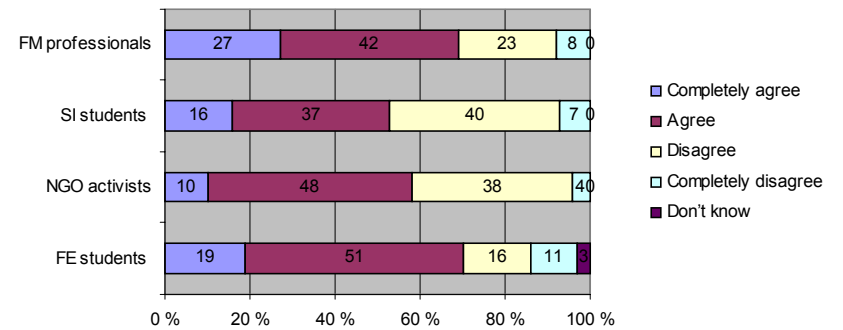


Figure 7. Answers to question about forest related income.

More than 50 % of the respondents disagree that the economic policy of RK promotes sustainable forestry (question № 13, Figure 8). High percentage of answers «Don't know» among the students of forest engineering and silviculture and NGO activists shows that this question does not correspond with their knowledge [36]. Probably, these groups are insufficiently informed about activities of the Government of RK in this field [21, 22].

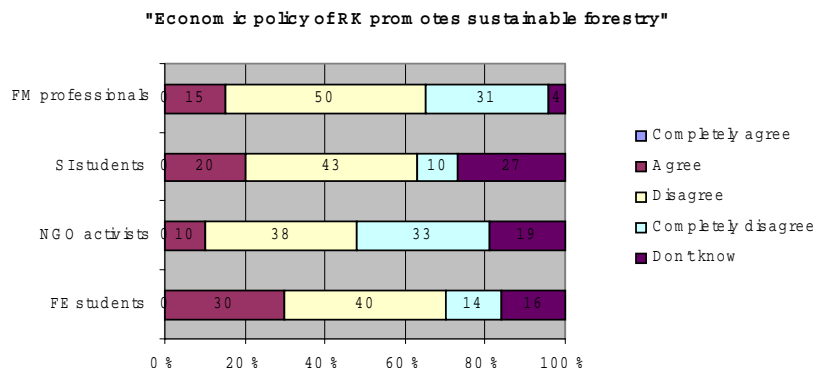


Figure 8. Answers to question about economic policy in Karelia.

The respondents think (questions № 14, 15) that actors of the Karelian forest sector do not pursue an open and interactive communication, and have no common understanding of direction of the future development (Figure 9). But, the high percentage of answers «Don't know» can be interpreted as confirmation of the stated opinion.

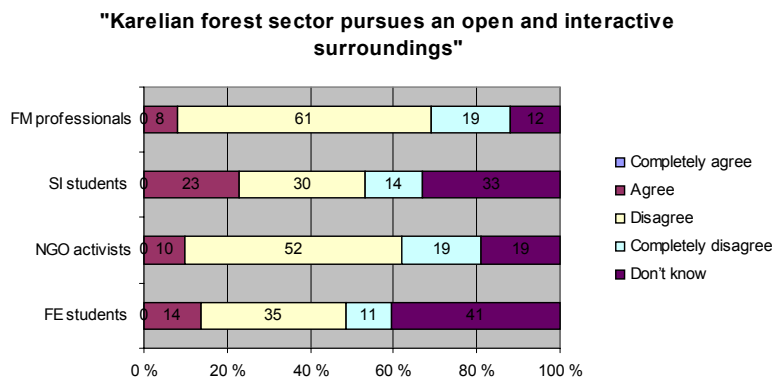


Figure 9. Answers to question about circumstances in the Karelian forest sector.

More than 60 % of the respondents disagree that nature tourism is well marketed and well organised (questions № 8, 9).

But, high percentage of answers «Don't know» on these questions show that respondents are insufficiently informed about the nature tourism and its prospects for the development of the Karelian economy.

**2<sup>nd</sup> block «Culture»** (Annex table A.2). The respondents' answers on the question whether Karelian citizens respect principles of sustainability have divided half (question № 1). But, high percentage of answers «Don't know» on this question show that question does not correspond with their knowledge [36]. More than 70 % of the respondents do not agree that the Government policy supports traditional life style of forest regions (question № 3, Figure 10). High percentage of answers «Don't know» among students of forest engineering and silviculture and NGO activists shows this question not corresponding with their knowledge [36].

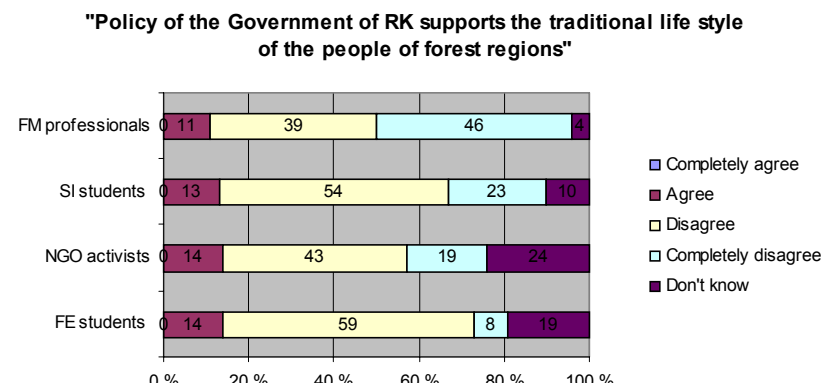


Figure 10. Answers to question about policy in Karelia.

More than 60 % of the respondents consider, that villages in the forest regions are worth visiting due to their traditional architecture (question № 4), which creates unique possibilities for development of nature tourism (including farm tourism). However, answers on the question whether industrial log house production is based on traditional methods and architecture have divided half. Also, respondents could not answer definitely whether traditional meals utilising wild berries and mushrooms and fish are a great asset of nature tourism (questions № 2, 5). High percentage of answers «Don't know» among the respondents shows, that questions № 2, 4 and 5 do not correspond with their knowledge [36].

Forest management professionals disagree that the Government policy supports the traditional means of livelihood in the Karelian forest regions (question № 6). Students of forest engineering and silviculture and NGO activists' answers on this question have divided half. High percentage of answers «Don't know» among students of forest engineering and silviculture and NGO activists shows, that this question does not correspond with their knowledge [36]. Also, it can be interpreted as confirmation of the stated opinion.

More than 75 % of the respondents do not agree that young people have future in the Karelian forest regions (question № 9, Figure 11).

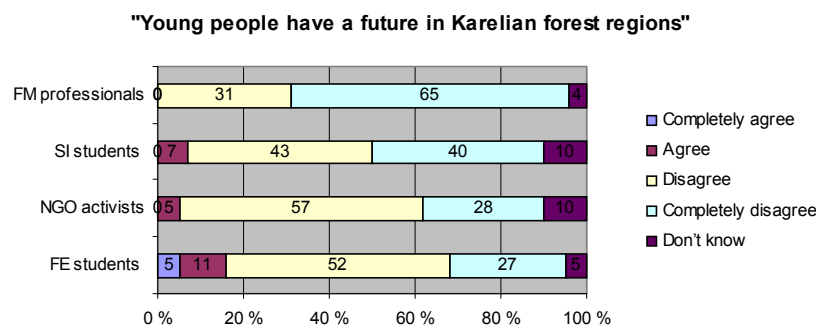


Figure 11. Answers to question about future perspectives in the Karelian forest sector.

The questionnaire study has shown that the traditional Finno-Ugrian culture, as well as Russian forest bound culture of Karelia is in the focus of academic research (questions № 7, 8). But high percentage of answers «Don't know» on these questions (up to 50 %) shows that the issue does not correspond with respondents' knowledge [36].

**3<sup>rd</sup> block «Forestry education»** (Annex table A.3). More than 60 % of the respondents do not agree that Karelian schools provide pupils with good knowledge of forest, and that all aspects of sustainability are equally presented in the educational system from primary level to universities (questions № 1, 11). High percentage of answers «Don't know» on the question № 11 shows that this question does not correspond with respondents' knowledge [36].

More than 50 % of students of forest engineering and silviculture and forest management professionals agree that Karelia has vocational schools producing qualified professionals for the forest sector (question № 2). The NGO activists could not answer definitely on this question. High percentage of answers «Don't know» on the question № 11 shows that this question does not correspond with respondents' knowledge [36]. Also, it can be interpreted as confirmation of the stated opinion.

More than 60 % of students of forest engineering and silviculture and forest management professionals agree that Karelian universities educate qualified managers and technicians for the forest sector, and marketing skills have good share in the academic education supply in Karelia (questions № 3, 4, 5). But, NGO activists answered negatively on questions № 3 and 5. NGO activists agree with other groups on the question № 4 about educating technicians. High percentage of answers «Don't know» on the questions № 3, 4, 5 among NGO activists shows that additional research is needed [36].

More than 50 % of the respondents do not agree that Karelian students have possibilities to co-operate with their foreign student-mates (question № 7). At the same time, more than 30 % of each group of the respondents do not agree that Karelian students have possibilities to receive scholarships from enterprises of the Karelian forest sector for studying abroad in the institutes of their own profession. High percentage of answers «Don't know» on this question shows that question does not correspond with respondents' knowledge. Most probably, there are no such possibilities at all. [36].

Students of forest engineering and forest management professionals agree that Karelian professionals have regular possibilities to participate life-long education of their own field and that life-long education system encourages professionals to plan their career, to develop skills for the next hierarchical stage (questions № 9, 10, Figure 12). But, NGO activists and students of silviculture answered negatively on these questions. High percentage of answers «Don't know» on the questions № 3, 4, 5 among NGO activists and students of silviculture show that additional research is needed [36].

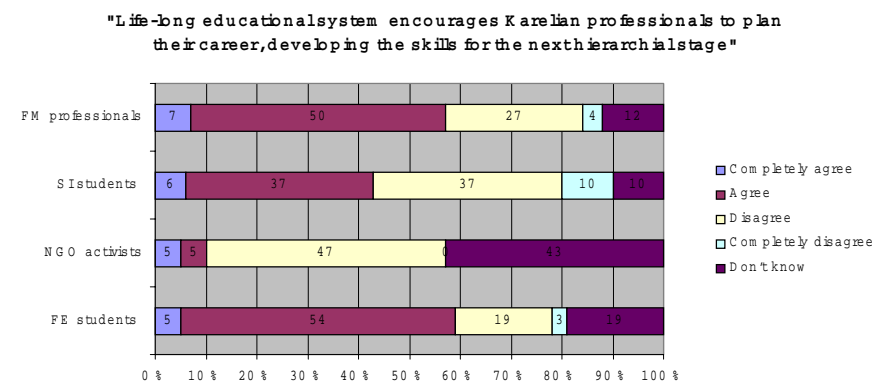


Figure 12. Answers to question about education.

The majority of students of forest engineering and silviculture, NGO activists (students as well) and forest management professionals do not agree that Karelian forest sector employs remarkable share of young specialists after their graduation (question № 6, Figure 13). High percentage of answers «Don't know» among students of forest engineering and silviculture and NGO activists may tell about their uncertainty of receiving jobs in the Karelian forest sector.

"Karelian forest sector employs a good share of young specialists after graduation"

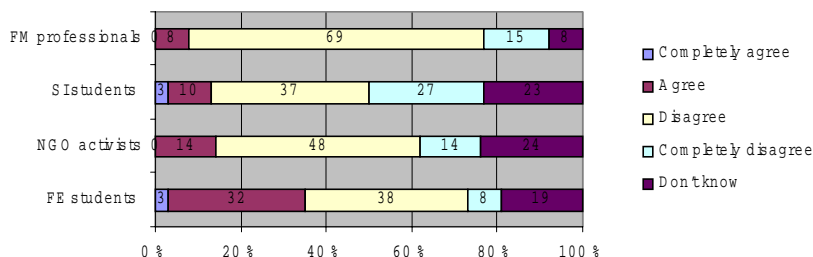


Figure 13. Answers to question about work possibilities in the Karelian forest sector.

**4<sup>th</sup> block «Enterprises of the forest sector»** (Annex table A.4). It is necessary to note that high percentage of answers «Don't know» on the block's questions among students and NGO activists shows that these questions do not completely correspond with these respondents' knowledge and experience [36].

More than 50 % of students of forest engineering and forest management professionals agree that enterprises of the Karelian forest sector have interest to increase quality of their products (question № 1, Figure 14). High percentage of answers «Don't know» on this question among students of forest engineering and forest management professionals shows that question does not correspond with respondents' knowledge [36].

"Enterprises of Karelian forest sector have interest to increase quality of their production"

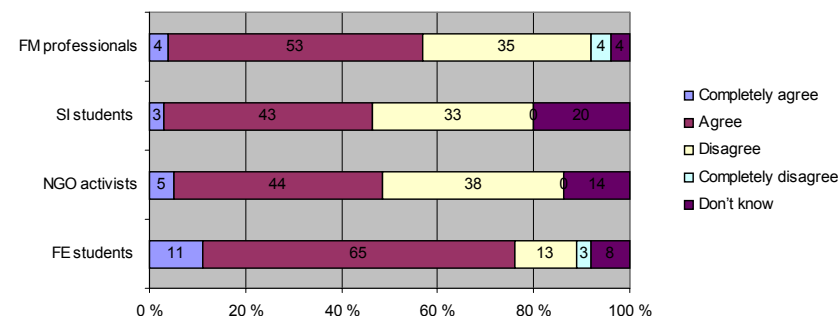


Figure 14. Answers to question about quality of the Karelian forest sector's production.

All groups of respondents are not sure that sufficient energy supply is available for the growing Karelian forest sector (question № 8), nor that the policy of the Karelian Government actively supports positive development of the Karelian forest sector (question № 9, Figure 15).

"Government of RK has an active role in the economic policy to support positive development of Karelian forest sector"

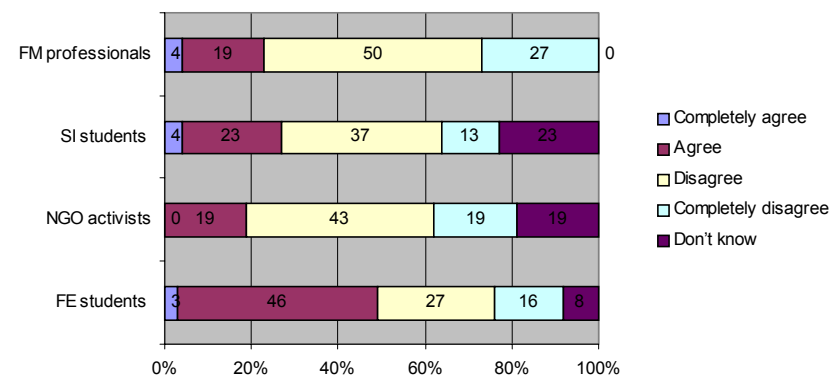


Figure 15. Answers to question about the role of the Government of RK.

More than 50 % of the respondents do not agree that the tax-policy is logical and makes a solid base for the future planning of the Karelian forest sector (question № 10). More than 65 % of the respondents note that local and regional infrastructure does not make a good basis for Karelian forest sector activities (question № 7, Figure 16).

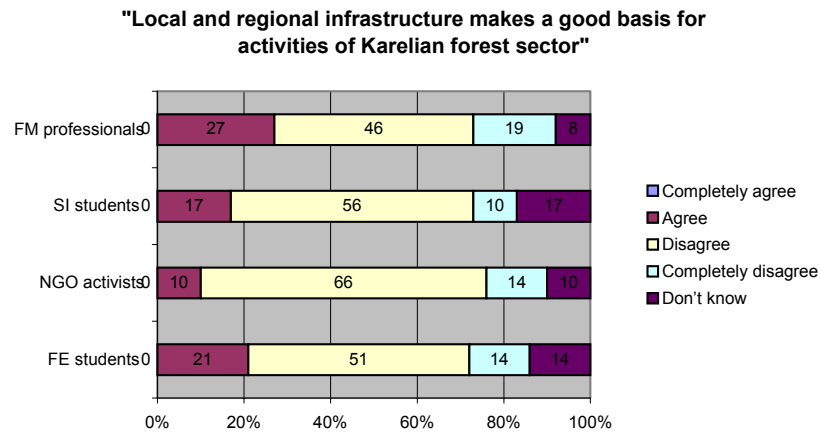


Figure 16. Answers to question about the role of the infrastructure.

The respondents have objectively evaluated current situation in the Karelian forest sector, but high percentage of answers «Don't know» on the block's questions shows that additional research is needed [36].

All respondents (especially, students of forest engineering and forest management professionals, more than 60 %) confirmed, that enterprises of the Karelian forest sector are market-oriented (question № 11), see part 1.4.

More than 70 % of forest management professionals agree that strikes are not a problem for the Karelian forest sector (question № 12). Students' answers on this question have divided half, but high percentage of answers «Don't know» on shows that question does not correspond with their knowledge [36].

Respondents could not answer definitely whether enterprises of the Karelian forest sector are known of their reliability as international business partners (question № 2). At the same time, the respondents do not agree that international investments into the Karelian forest sector are safe and profitable (questions № 3, 4, Figures 17, 18).

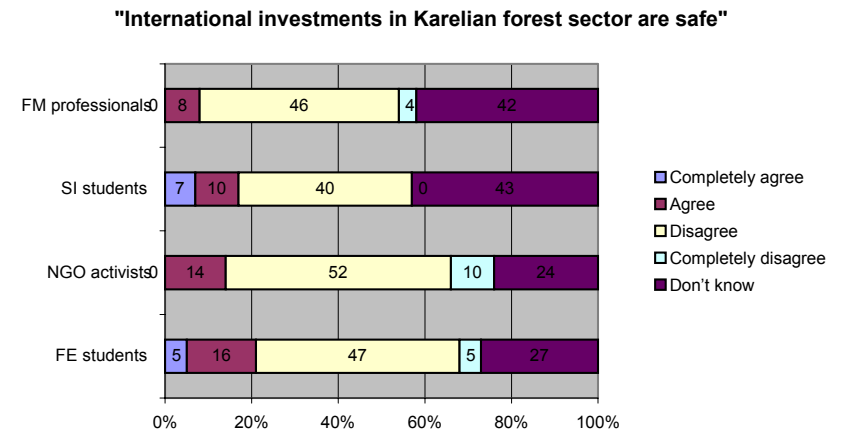


Figure 17. Answers to question about the safety of investments.

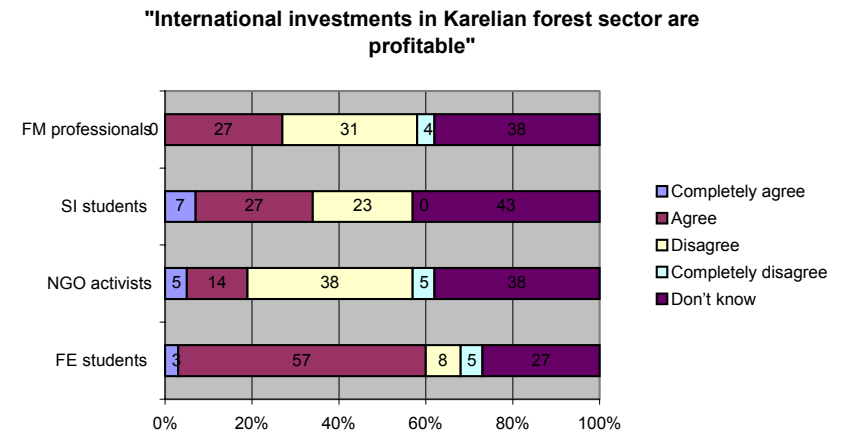


Figure 18. Answers to question about the profitability of investments.



**5<sup>th</sup> block «Standard of living»** (Annex table A.5). More than 60 % of the respondents are confirmed that Karelian forest sector is the basis of Karelian economy (question № 1). More than 50 % of the respondents agree that progress of the forest sector can be seen in social and economic standards of living in the Karelian forest regions (question № 7).

More than 60 % of the respondents (especially forest management professionals) do not agree that enterprises of the Karelian forest sector have written personnel policies to make a safe basis for employees' activation and that forest sector workplaces are healthy and safe (questions № 2, 3). More than 40 % of the respondents do not agree that industrial democracy is alive at enterprises in the Karelian forest sector (question № 4).

Majority of the respondents (more than 70 %) does not agree that Karelian forest sector employees can plan their personal living standard in the long run with confidence (question № 5, Figure 19).

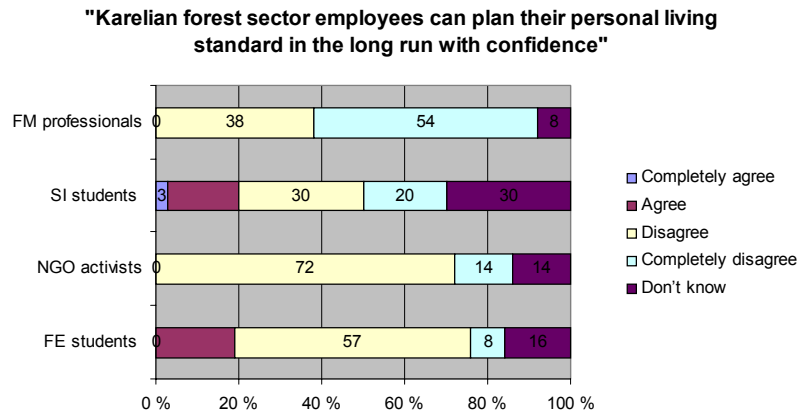


Figure 19. Answers to question about confidence of the forest sector employees.

High percentage of answers «Don't know» on this question shows that additional research is needed [36]. Also, it can be interpreted as confirmation of the stated opinion.

The respondents suppose that in opinions of students the Karelian forest sector seems to be a promising sector of the economy (question № 6).

#### 4.2. Opinion on forest resource ownership

Results of the questionnaires are presented in Annex tables B.1 and B.2. Checking the homogeneity of the results of the questionnaire study on opinion

on forest resource ownership by criterion  $\chi^2$  showed that it is possible to accept the hypothesis of homogeneity of all three groups' answers for each question (reliability level 0.9) [3, 36]. The same criterion was used to confirm that differences in answers were statistically significant [3, 36]. **Thus, employees of the Forest Service of Karelia, local administrations and forest industry have an united opinion on the problem of forest resource ownership.**

Majority of the respondents (74 %) supports the preservation of the federal state forest ownership in Russia (question № 1). Respondents' answers on the question about the possibility to introduce private forest ownership in Russia divided approximately half (question № 3, Figure 20).

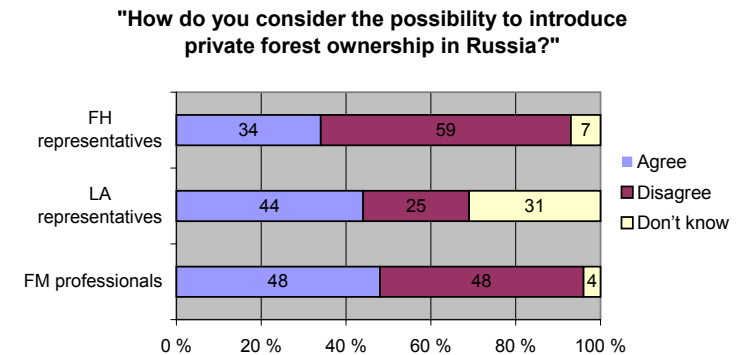


Figure 20. Answers to question about the private forest ownership.

47 % of the respondents support the possibility of introducing forest ownership to federation subjects in Russia (question № 5). 53 % of the respondents agree that transferring forest resources into long-term lease is a step towards private forest ownership (question № 2). 50 % of the respondents do not agree that introducing a diversity of forest resource ownership forms will promote rational use of forest resources and preservation of valuable forest territories in Russia (question № 4, Figure 21).

The respondents prefer that over 80 % of the forest resources would remain in the ownership of the state, republic or local administrations, and 10 % would be transferred into the ownership of commercial organizations (question № 6, Figure 22). This agrees well with the respondents' answers to questions № 1, 3 and 5 [36].



**"Diversification of forest resource ownership forms will promote rational use of forest resources and preservation of valuable forest territories in Russia?"**

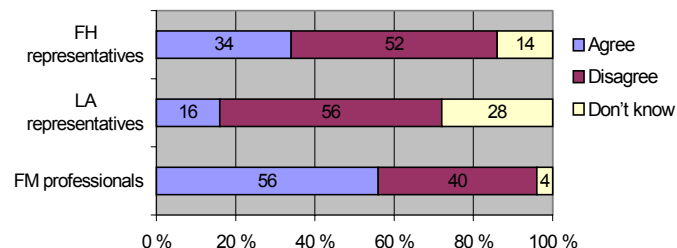


Figure 21. Answers to question about diversification of forest ownership forms.

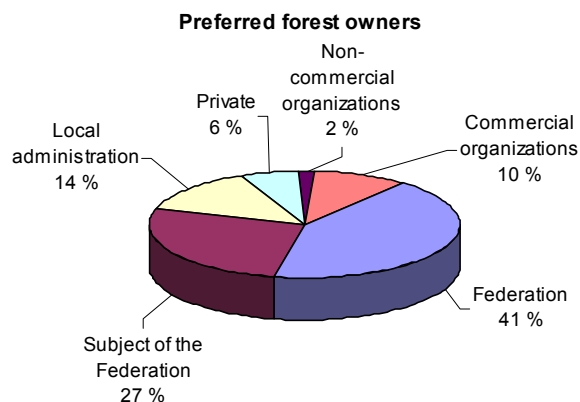


Figure 22. Distribution of preferable owners of the forest resources.

High percentage of answers «Don't know» on the questions № 3, 4, 5 shows that additional research is needed [36].

#### 4.3. Notions on the development of forest use

Checking of the homogeneity of results of the questionnaire study on notions on the development of forest use by criterion  $\chi^2$  showed that it is possible to accept the hypothesis of homogeneity of all three groups' answers for each

question (reliability level 0.9) [3, 36]. **Thus, employees of the Forest Service of Karelia, local administrations and forest industry have united opinion on most preferable forms of forest use for Karelia.**

Respondents placed wood harvesting on the leading position, total weight of final and intermediate fellings being 59 %. Using forests for cultural, health-care, tourist and sports purposes takes the third place. Total weight of popular forms of non-timber forest use as collection of sap, nuts, berries, mushrooms, medical plants, using forests for hunting as well as for cultural, health-care, tourist and sports purposes is 20 % what is comparable with the significance of intermediate fellings (Table 7).

Table 7. Significance of different forms of forest use.

Forms of forest use	%
1. Final fellings (selection, gradual, clear fellings)	39.8
2. Intermediate fellings (thinning, reconstruction, sanitary felling, etc.)	18.9
3. Resin collection	2.0
4. Collection of forest by-products (stumps, bark, coniferous branches, Christmas trees etc.)	3.2
5. Collection of sap, nuts, berries, mushrooms and medical plants	6.6
6. Collection of moss, forest litter and fallen leaves, cane etc.	3.2
7. Establishing plantations of food and medicinal plants (vegetable, nuts, berries, mushrooms, etc.)	2.9
8. Hay-making and cattle grazing	3.1
9. Beekeeping	1.7
10. Animal farming	2.0
11. Using forests for hunting	5.0
12. Using forests for research purposes	3.5
13. Using forests for cultural, health-care, tourist and sports purposes	8.1
Total	100

#### 4.4. General notions on forest users

Checking the homogeneity of results of the questionnaire study on general notions on forest users by criterion  $\chi^2$  showed that it is possible to accept the hypothesis of homogeneity of all three decision maker groups' answers for each sub-criterion (reliability level 0.9).

**Thus, employees of the Forest Service of Karelia, local administrations and forest industry have united understanding about the qualities, which a**

**long-term leaser of forests in Karelia should have.** According to these decision maker groups, most important qualities of the long-term leaser of Karelian forests are: possessing resources for wood harvesting and processing in Karelia, financing forest management in leased forests and running profitable business and paying taxes to the republican budget (Table 8).

Table 8. Significance of criteria describing important qualities of forest leaser.

Most important criteria	%
Amount of wood processed at respondent's mechanical woodworking enterprises:	
in Karelia	14.40
in Russia	1.29
outside Russia	0.58
Amount of wood processed at respondent's pulp and paper enterprises:	
in Karelia	6.57
in Russia	1.27
outside Russia	0.45
Amount of wood harvested at respondent's harvesting enterprises:	
in Karelia	15.47
in Russia	1.90
outside Russia	0.25
Duration of registration as legal entrepreneur in state tax body of Karelia	8.28
Amount of debts to the state budget	8.08
Sustainable solvency at the moment of applying to the forest auction	10.57
Amount of the respondent's net profit	7.37
Planned amount of sustainable wood harvesting	7.70
Planned amount of investments into forestry	9.43
Amount of wood sold to local administrations	4.75
Other	1.64
<b>Total</b>	<b>100.00</b>

#### 4.5. Notions on forest conservation

Results of the questionnaires are presented in Annex table C.1. Results of the questionnaire study on notions on forest conservation among employees of the Forest Service of Karelia shows that 88 % of the respondents know that nature protection areas with strict regime of nature protection (i. e. with full interdiction of wood harvestings) cover only 2 % of the Karelian territory (question № 1). 76 % of the respondents support increasing the protected area with full interdiction of wood harvestings up to 7 % of the Karelian territory (question № 5, Figure 23). 52 % of the respondents are not satisfied with the

policy of RK in the field of nature protection (question № 6, Figure 24).

The majority of respondents (68 %) would like the Karelian Government to establish water-protecting zones along all rivers, streams and lakes, irrespective of their size (question № 7). Less than 50 % of the respondents have confirmed that inhabitation places of the «Red Book» plants and animals are officially situated on the territory of their enterprises (question № 3), and 12 % of the respondents have answered «Don't know».

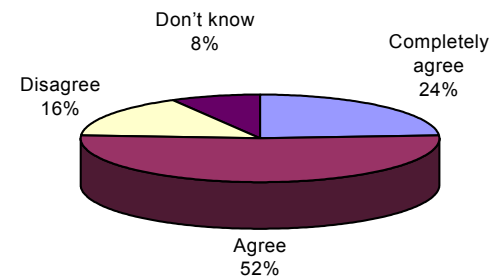


Figure 23. Answers to question about increasing protected territory in Karelia.

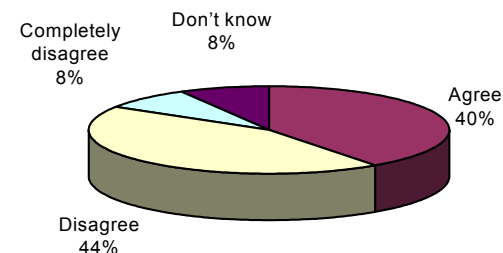


Figure 24. Answers to question about the policy of RK on nature protection.

more than 60 % of the respondents approve ecological NGO activities in Karelia (questions № 4, 8, Figures 25, 26). But, 16 % of respondents have answered «Don't know» on the question № 8, thus additional research is needed [36]. 60 % of the respondents consider that the main problem of ecological NGOs is the low professionalism followed by high self-conceit (question № 2).

20 % of the respondents have answered «Don't know», thus additional re-

search is needed [36].

48 % of the respondents suppose that forest management plans, which did not pass official ecological expertise, are being used at their enterprises, while 20 % of respondents cannot answer to this question (question № 9, Figure 27). 48 % of the respondents agree that young stands cover 39 % of all forested lands in Karelia. But, 40 % of the respondents have answered «Don't know».

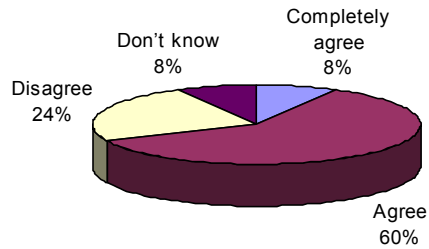


Figure 25. Answers to question about presence of activities of ecological NGO in forest conservation.

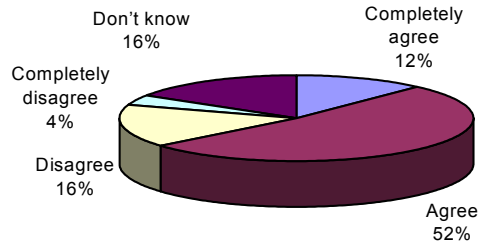


Figure 25. Answers to question whether activities of ecological NGO promote conservation of Karelian valuable forests.

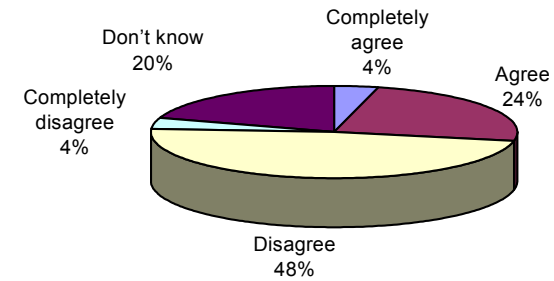


Figure 27. Answers to question about legality of forest management plans, used by forest management enterprises in Karelia.

60 % of the respondents are confirmed that more than 80 % of cuttings implemented on the territory of their enterprises are clear-cuttings (question № 11 Figure 28).

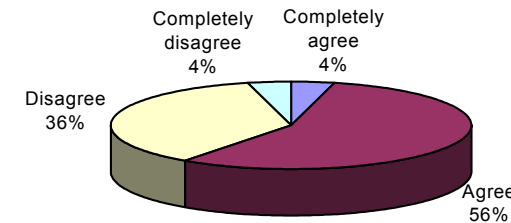


Figure 28. Answers to question whether more than 80 % of cuttings in Karelia are clear-cuttings.

The answers on the question whether it is necessary to legislatively divide Karelian forest fund into zone with mandatory artificial reforestation and zone with assisted natural regeneration have divided approximately half (question № 12).

76 % of the respondents disagree to cancel fines charged for leaving non-commercial broad-leaved trees in harvesting sites in Karelia (question № 13)

## 5. CONCLUSIONS

The proximity of answers of students of forest engineering and silviculture can be explained by similarity of knowledge on the Karelian forests and forest sector. Polar positions of forest management professionals and NGO activists confirm the conclusion, that conflict between forest management professionals and NGO activists taking place in Karelia is based on different notions on forest management efficiency and prospects of the Karelian forest sector. Differences concerning question about enterprises of the forest sector can also be explained by students' more critical opinion on current situation. Education, professional experience and formed life position explain the essential difference of forest management professionals' answers. The difference in the answers of forest management professionals and NGO activists shows that there is a discrepancy between the theory and practice of forestry management in Russia and Karelia as well.

Increasing transparency and coordination between the actors of the Karelian forest sector (especially, in the fields of timber export and processing) is one of the main directions of the Karelian Government's activities [21, 22]. However, there has not been observed any significant changes in 1998–2002 [13, 25]. Results of this study incontrovertibly show need for improvement in transparency and interactivity in the Karelian forest sector.

There was a high share of answers «Don't know» in questions concerning use of Karelian traditions in nature tourism and log house production. It can partly be interpreted as confirmation that the traditional Karelian culture is insufficiently utilized for development of the log house production and nature tourism. Also, results of the study indicate that possibilities of nature tourism and processing the non-timber forest products are not fully exploited. It is known, that there is lack of processing and berries and mushrooms are mainly exported unprocessed [14]. At the present forest industry brings income to the budget ten times more than tourism. Although, rich Karelian forests create good preconditions for development of nature tourism. Contrary to the majority of answers, according to the local Department of the Ministry of the Natural Resources of the Russian Federation, there are only local pollutions of forests in the vicinities of Karelian settlements and enterprises [6].

Remarkably high share of the respondents consider that young people have no future in Karelian forest regions, which can be explained by high level of unemployment and unsatisfactory social conditions in settlements of the Karelian forest regions. High percentage of answers «Don't know» among students of forest engineering and silviculture and NGO activists to the question about employment possibilities after graduation also tells about low expectations on

the future in the Karelian forest sector.

The respondents have most probably evaluated objectively current situation in the Karelian forest sector, as most of the forest sector top managers took their positions in the Soviet period [11]. High share of answers «Don't know» on the theme enterprises of the forest sector can be connected with the lack of open information about activities of the Karelian forest industry among the respondent groups representing forest management and silviculture.

Situation in the forest industry complex could be improved on the basis of consolidating capitals of large-sized forest industry enterprises and active participation of Government of RK. Firstly, it should concern ensuring wood procurement of Karelian wood processing enterprises and developing local and regional infrastructure for Karelian forest sector activities, first of all in the field of forest road construction [25]. It is already counted that the process would allow to increase production of the forest sector from 15 to 42 million RUR/year, and in the long term 95 million RUR/year [25].

The absence of strikes in the Karelian forest sector is explained on the one hand, by backwardness of democratic institution, and on the other hand, by community-forming role of the forest enterprises and by high level of unemployment in the Karelian forest regions [8, 14, 25, 26]. Low wages and high unemployment do not stimulate employers to invest into improvement of working conditions [8, 26].

The high percentage of answers «Don't know» in the questions concerning forms of forest resource ownership might be connected with on-going discussions among Russian forest professionals and NGO activists on advantages and disadvantages of different forms of forest ownership. The forest resource distribution among all forms of forest ownership is the intermediate step between existing model (100 % of forests are in the federal state ownership) and so-called «Canadian» model (almost 95 % of forests are in the ownership of provinces, analogues to subjects of Federation) [27]. It is known, that forestry conducted in Russia, as well as the «Canadian» model do not allow to achieve similar economical results as in countries with advanced private forest ownership [5, 27]. The new Forest Code will most probably include possibility for private forest ownership.

Majority of the respondents approve ecological NGO activities, but it can be concluded from the answers that the forest management related conflict between forest users, employees of the Forest Service of Karelia and NGO activists is still going on in Karelia. Answers supposing low professionalism among the NGO activists contradict the information that most of Russian NGO activists have higher education or scientific degrees in biological science [11]. The question whether Russian system (and practice) of forestry management pro-

motes biodiversity is a subject of continuous discussions also among scientists and ecological NGO activists [10, 33, 37]. It is confirmed by dispersion in opinions of students of silviculture and NGO activists.

Remarkably small share of answers indicate that the ecological expertise is applied in the forest use. Assignment of forest sites for wood harvestings without taking into account inhabitation places of these valuable and disappearing plants and animals is violation of the nature protecting legislation of Russia [32, 37]. According to the information of the Forest Service of Karelia presented at the roundtable discussions «Illegal cuttings in Karelia: Myth or reality?» in 2003, the ecological expertise of forest management plans have not been implemented, despite of the fact that the federal Law «On ecological expertise» came into force in 1995. The main reason is absence of financing from the federal bodies of the Ministry of Natural Resources.

High percentage of answers «Don't know» was obtained on questions connected to valuable and rare plants, ecological expertise, and nature conservation. Obviously, the respondents are insufficiently informed about the ecological aspects of the Karelian forest recourses.

The predominance of clear-cuttings in the forest use contradicts with real age structure of the Karelian forests [13, 14, 25]. The uneven age structure of the Karelian forests can result in reduction of annual allowable cut of final fellings in 3.5 times in the long-term period [22].

The answers on the question whether it is necessary to legislatively divide Karelian forest fund into zone with mandatory artificial reforestation and zone with assisted natural regeneration have divided approximately half. Large part of the territory of Karelia belongs to the Northern taiga, and only southern regions of Karelia belong to the Middle taiga. It is recommended to carry out assisted natural regeneration on harvested forest sites in the Northern taiga, and to carry out mandatory artificial reforestation on harvested forest sites in the Middle taiga vegetation zone in case of lack of coniferous natural seedlings [1, 28, 30].

The majority of respondents support establishment of water-protecting zones along all rivers, streams and lakes irrespective of their size. These measures would promote stabilization of high-flood mode of Karelian rivers and lakes, as well as allow saving unique coastal ecosystems.

Majority of the respondents disagree to cancel fines charged for leaving non-commercial broad-leaved trees in harvesting sites in Karelia. It is well known that unharvested broad-leaved trees protect natural coniferous seedlings from extreme temperatures, as well as prevent further dissemination of deciduous tree seedlings on clear cut forest sites [10, 30]. At the same time, harvesting costs exceeds market prices received from non-commercial broad-

leaved timber. Thus, fines charged for leaving this wood are not justified neither from forestry, nor from an economic point of view. Therefore, these fines are cancelled for example in Vologda region, situated next to Karelia.

Presented results of the questionnaire study can be utilized for improving the policy and strategy of the Government of RK in the fields of forest use and development of Karelian forest industry for the long-term period. The clarification of level of insufficient knowledge on the current statement of Karelian forest recourses among these groups of respondents can become basis for further researches, for example in following directions:

- Notions on the role of the Government of RK in the development of the Karelian forest sector;
- Notions on prospect of different kinds of forest use in Karelia;
- Influence of different forms of forest use to the socio-economic development in Karelia;
- Notions on all aspects of sustainability;
- Notions on enterprises of Karelian forest sector.

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## ANNEX

(RESULTS OF QUESTIONNAIRE STUDY)

«GENERAL NOTIONS ON FOREST SECTOR»

Results of questionnaire study

№	Question	Group of respondents
1	2	3
1	Karelian forests are unspoiled	FE students
		NGO activists
		SI students
		FM professionals
2	Karelia has vast forests	FE students
		NGO activists
		SI students
		FM professionals
3	Biodiversity, is the basic principle of Karelian forestry	FE students
		NGO activists
		SI students
		FM professionals
4	Citizens of Karelian forest regions earn their income working in the forest	FE students
		NGO activists
		SI students
		FM professionals
5	Citizens of Karelian forest regions can benefit the berries and mushrooms to earn extra income	FE students
		NGO activists
		SI students
		FM professionals
6	Berries and mushrooms of Karelian forests are pure and safe to eat	FE students
		NGO activists
		SI students
		FM professionals
7	Karelian forests make safe surrounding for tourism	FE students
		NGO activists
		SI students
		FM professionals
8	Nature tourism is well organised in Karelia	FE students
		NGO activists
		SI students
		FM professionals

Table A.1

of 1-st block «Rich forests», %

№	Variants of the answer				
	Completely agree	Agree	Disagree	Completely disagree	Don't know
<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
1	5	19	65	11	0
	10	28	57	5	0
	3	7	67	20	3
2	0	36	48	16	0
	16	70	14	0	0
	0	57	38	5	0
3	20	73	7	0	0
	8	48	40	4	0
	3	68	21	3	5
4	19	28	24	24	5
	20	23	37	3	17
	12	64	20	0	4
5	19	51	16	11	3
	10	48	38	4	0
	16	37	40	7	0
6	27	42	23	8	0
	<b>49</b>	<b>51</b>	<b>0</b>	<b>0</b>	<b>0</b>
	<b>48</b>	<b>52</b>	<b>0</b>	<b>0</b>	<b>0</b>
7	44	53	3	0	0
	27	69	4	0	0
	22	62	0	5	11
8	14	71	0	5	10
	20	53	17	0	10
	12	77	7	4	0
9	21	62	11	3	3
	29	57	9	0	5
	30	46	17	0	7
10	15	62	11	8	4
	0	3	54	30	13
	0	5	66	24	5
	0	0	63	23	14
11	0	0	58	30	12



Results of questionnaire study

№	Question	Group of respondents
1	2	3
9	Nature tourism is well marketed in Karelia	FE students
		NGO activists
		SI students
		FM professionals
10	Processing of berries and mushrooms to be sold in international markets provides a great amount of Karelian citizens with jobs and income	FE students
		NGO activists
		SI students
		FM professionals
11	Timber of Karelian forests makes high quality raw material for saw-milling	FE students
		NGO activists
		SI students
		FM professionals
12	Timber of Karelian forests makes high quality raw material for pulp-and-paper industry	FE students
		NGO activists
		SI students
		FM professionals
13	Economic policy of RK promotes sustainable forestry	FE students
		NGO activists
		SI students
		FM professionals
14	Karelian forest sector pursues an open and interactive communication	FE students
		NGO activists
		SI students
		FM professionals
15	Actors of Karelian forest sector have a goal-directed common understanding of development lines	FE students
		NGO activists
		SI students
		FM professionals

Continuation of table A.1

of 1-st block «Rich forests», %

№	Variants of the answer				
	Completely agree	Agree	Disagree	Completely disagree	Don't know
4	5	6	7	8	9
9	0	16	54	11	19
	0	5	62	19	14
	0	10	57	13	20
	0	0	61	27	12
10	5	43	41	11	0
	5	33	38	10	14
	6	30	50	7	7
	8	19	42	31	0
11	30	62	8	0	0
	5	62	14	0	19
	27	73	0	0	0
	30	58	12	0	0
12	33	56	8	0	3
	9	71	10	0	10
	27	70	3	0	0
	31	65	4	0	0
13	0	30	40	14	16
	0	10	38	33	19
	0	20	43	10	27
	0	15	50	31	4
14	0	14	35	11	41
	0	10	52	19	19
	0	23	30	14	33
	0	8	61	19	12
15	3	24	32	14	27
	0	0	57	19	24
	0	13	44	3	40
	0	12	50	26	12

Table A.2

## Results of questionnaire study

<b>№</b>	<b>Question</b>	<b>Group of respondents</b>
<b>1</b>	<b>2</b>	<b>3</b>
1	Karelian citizens respect principles of sustainability	FE students
		NGO activists
		SI students
		FM professionals
2	Traditional meals utilising wild berries and mushrooms, and fish are a great asset of nature tourism in Karelia	FE students
		NGO activists
		SI students
		FM professionals
3	Policy of the Government of RK supports the traditional life style of the people of forest regions	FE students
		NGO activists
		SI students
		FM professionals
4	Karelian forest regions villages are worth visiting because of their traditional architecture	FE students
		NGO activists
		SI students
		FM professionals
5	Industrial log house production is based on tradition by method and architecture	FE students
		NGO activists
		SI students
		FM professionals
6	Policy of the Government of RK supports traditional means of livelihood of forest regions	FE students
		NGO activists
		SI students
		FM professionals
7	Tradition of Finno-Ugrian culture of the forest regions is in focus of academic research in RK	FE students
		NGO activists
		SI students
		FM professionals
8	Tradition of Russian forest bound culture of Karelia is in focus of academic research in RK	FE students
		NGO activists
		SI students
		FM professionals

## of 2-nd block «Culture», %

<b>№</b>	<b>Variants of the answer</b>				
	Completely agree	Agree	Disagree	Completely disagree	Don't know
<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
1	3	49	13	3	32
	0	29	38	0	33
	3	30	40	0	27
	0	36	44	12	8
2	6	43	27	8	16
	5	28	24	5	38
	3	47	44	3	3
	0	31	42	15	12
3	0	14	59	8	19
	0	14	43	19	24
	0	13	54	23	10
	0	11	39	46	4
4	16	52	24	3	5
	19	66	10	5	0
	20	43	37	0	0
	4	50	27	15	4
5	3	32	35	6	24
	0	33	43	10	14
	7	33	43	0	17
	0	27	50	15	8
6	8	35	30	5	22
	5	19	52	10	14
	3	34	37	13	13
	0	8	54	30	8
7	<b>11</b>	<b>43</b>	<b>16</b>	<b>0</b>	<b>30</b>
	<b>10</b>	<b>42</b>	<b>19</b>	<b>0</b>	<b>29</b>
	3	37	23	7	30
	0	36	20	4	40
8	8	35	11	0	46
	10	14	43	0	33
	3	33	17	3	44
	0	19	27	4	50

## Results of questionnaire study

<b>№</b>	<b>Question</b>	<b>Group of respondents</b>
<b>1</b>	<b>2</b>	<b>3</b>
9	Young people have a future in Karelian forest regions	FE students
		NGO activists
		SI students
		FM professionals

## Results of questionnaire study

<b>№</b>	<b>Question</b>	<b>Group of respondents</b>
<b>1</b>	<b>2</b>	<b>3</b>
1	Karelian schools provide the pupils with good knowledge of the forest	FE students
		NGO activists
		SI students
		FM professionals
2	Karelia has vocational schools that produce qualified professionals for the forest sector	FE students
		NGO activists
		SI students
		FM professionals
3	Karelian universities educate qualified managers for the forest sector	FE students
		NGO activists
		SI students
		FM professionals
4	Karelian universities educate qualified technicians for the forest sector	FE students
		NGO activists
		SI students
		FM professionals
5	Marketing skills have a good share in the academic education supply in Karelia	FE students
		NGO activists
		SI students
		FM professionals

## of block 2 «Culture», %

<b>№</b>	<b>Variants of the answer</b>				
	Completely agree	Agree	Disagree	Completely disagree	Don't know
<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
9	5	11	52	27	5
	0	5	57	28	10
	0	7	43	40	10
	0	0	31	65	4

Table A.3

## of 3-rd block «Forest education», %

<b>№</b>	<b>Variants of the answer</b>				
	Completely agree	Agree	Disagree	Completely disagree	Don't know
<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
1	0	24	60	11	5
	5	10	66	19	0
	0	13	64	13	10
	0	12	61	27	0
2	0	54	11	5	30
	5	24	28	5	38
	6	60	17	0	17
	4	50	15	8	23
3	8	65	17	5	5
	5	38	38	5	14
	20	43	27	0	10
	0	56	12	4	28
4	8	73	11	5	3
	10	57	24	0	9
	27	43	27	0	3
	0	77	11	4	8
5	0	65	24	3	8
	5	24	47	0	24
	10	10	37	13	30
	0	46	12	0	42

## Results of questionnaire study

<b>№</b>	<b>Question</b>	<b>Group of respondents</b>
<b>1</b>	<b>2</b>	<b>3</b>
6	Karelian forest sector employs a good share of young specialists after graduation	FE students
		NGO activists
		SI students
		FM professionals
7	Karelian students have good possibilities to cooperate with their foreign student-mates	FE students
		NGO activists
		SI students
		FM professionals
8	Karelian students have a possibility to receive scholarships from enterprises of Karelian forest sector for studying abroad in the institutes of their own profession	FE students
		NGO activists
		SI students
		FM professionals
9	Professionals have a regular possibility to participate life-long education of their own field	FE students
		NGO activists
		SI students
		FM professionals
10	Life-long educational system encourages Karelian professionals to plan their career, developing the skills for the next hierarchical stage	FE students
		NGO activists
		SI students
		FM professionals
11	All the aspects of sustainability are equally present in Karelian educational system from primary level to the universities	FE students
		NGO activists
		SI students
		FM professionals

## of 3-rd block «Forest education», %

<b>№</b>	<b>Variants of the answer</b>				
	Completely agree	Agree	Disagree	Completely disagree	Don't know
<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
6	3	32	38	8	19
	0	14	48	14	24
	3	10	37	27	23
	0	8	69	15	8
7	3	46	33	10	8
	0	28	52	10	10
	4	13	50	13	20
	0	8	54	8	31
8	0	24	25	16	35
	0	5	38	5	52
	4	13	23	13	47
	0	7	35	27	31
9	8	67	8	3	14
	5	29	42	0	24
	10	23	33	3	30
	8	50	12	15	15
10	5	54	19	3	19
	5	5	47	0	43
	6	37	37	10	10
	7	50	27	4	12
11	0	38	43	5	14
	0	4	48	38	10
	0	17	60	6	17
	0	15	46	8	31

Table A.4

## Results of questionnaire study

№	Question	Group of respondents
1	2	3
1	Enterprises of Karelian forest sector have interest to increase the quality of their production	FE students
		NGO activists
		SI students
		FM professionals
2	Enterprises of Karelian forest sector are known of their reliability as international business partners	FE students
		NGO activists
		SI students
		FM professionals
3	International investments in Karelian forest sector are safe	FE students
		NGO activists
		SI students
		FM professionals
4	International investments in Karelian forest sector are profitable	FE students
		NGO activists
		SI students
		FM professionals
5	There are well co-operating business chains in Karelian forest sector from forest sites to international markets	FE students
		NGO activists
		SI students
		FM professionals
6	Enterprises of Karelian forest sector are working together to create synergy addition to the profitability of every partner	FE students
		NGO activists
		SI students
		FM professionals
7	Local and regional infrastructure makes a good basis for activities of Karelian forest sector	FE students
		NGO activists
		SI students
		FM professionals

## of 4-th block «Enterprises of forest sector», %

№	Variants of the answer				
	Completely agree	Agree	Disagree	Completely disagree	Don't know
4	5	6	7	8	9
1	11	65	13	3	8
	5	44	38	0	14
	3	43	33	0	20
	4	53	35	4	4
2	0	43	22	5	30
	5	9	33	5	48
	13	13	24	3	47
	0	31	27	8	34
3	5	16	47	5	27
	0	14	52	10	24
	7	10	40	0	43
	0	8	46	4	42
4	3	57	8	5	27
	5	14	38	5	38
	7	27	23	0	43
	0	27	31	4	38
5	0	35	16	11	38
	0	19	48	5	28
	3	37	27	0	33
	4	27	38	23	8
6	0	27	35	5	33
	0	14	52	10	24
	6	37	20	0	37
	0	28	36	20	16
7	0	21	51	14	14
	0	10	66	14	10
	0	17	56	10	17
	0	27	46	19	8

## Results of questionnaire study

<b>№</b>	<b>Question</b>	<b>Group of respondents</b>
<b>1</b>	<b>2</b>	<b>3</b>
8	Sufficient energy supply is available for growing Karelian forest sector	FE students
		NGO activists
		SI students
		FM professionals
9	Government of RK has an active role in the economic policy to support positive development of Karelian forest sector	FE students
		NGO activists
		SI students
10	Tax-policy is logical and makes a solid base for the future planning of Karelian forest sector	FE students
		NGO activists
		SI students
11	Enterprises of Karelian forest sector are market-oriented	FE students
		NGO activists
		SI students
		FM professionals
12	Strikes are not a Karelian forest sector problem	FE students
		NGO activists
		SI students
		FM professionals

## of 4-th block «Enterprises of forest sector», %

<b>№</b>	<b>Variants of the answer</b>				
	<b>Completely agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Completely disagree</b>	<b>Don't know</b>
<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
8	0	32	36	0	32
	0	10	33	5	52
	3	24	30	0	43
	0	46	19	4	31
	0	46	19	4	31
9	3	46	27	16	8
	0	19	43	19	19
	4	23	37	13	23
	4	19	50	27	0
10	0	27	40	14	19
	0	10	38	19	33
	0	10	37	7	46
	0	4	58	4	34
11	5	76	14	0	5
	0	47	24	5	24
	14	33	20	0	33
	4	61	23	0	12
12	8	30	35	3	24
	5	19	14	0	62
	3	33	27	10	27
	0	73	12	12	3

## Results of questionnaire study

<b>№</b>	<b>Question</b>	<b>Group of respondents</b>
<b>1</b>	<b>2</b>	<b>3</b>
1	Karelian forest sector is the basis of Karelian economy	FE students
		NGO activists
		SI students
		FM professionals
2	Enterprises of Karelian forest sector have written personnel policies to make a safe basis for activating of employees	FE students
		NGO activists
		SI students
		FM professionals
3	Karelian forest sector workplaces are healthy and safe	FE students
		NGO activists
		SI students
		FM professionals
4	Industrial democracy is alive in Enterprises of Karelian forest sector	FE students
		NGO activists
		SI students
		FM professionals
5	Karelian forest sector employees can plan their personal living standard in the long run with confidence	FE students
		NGO activists
		SI students
		FM professionals
6	In the opinions of students Karelian forest sector seems to be a promising sector of economy	FE students
		NGO activists
		SI students
		FM professionals
7	Progress of Karelian forest sector can be seen in social and economic standards of living in forest regions of RK	FE students
		NGO activists
		SI students
		FM professionals

## of 5-th block «Standard of living», %

<b>№</b>	<b>Variants of the answer</b>				
	Completely agree	Agree	Disagree	Completely disagree	Don't know
<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
1	24	65	8	0	3
	9	43	29	5	14
	23	67	3	0	7
	11	77	4	4	4
2	0	32	51	6	11
	0	14	66	10	10
	7	16	50	7	20
	0	27	69	0	4
3	0	13	68	11	8
	0	10	66	10	14
	0	27	50	10	13
	0	15	81	0	4
4	3	19	24	5	49
	0	5	43	0	52
	0	20	43	0	37
	0	8	46	31	15
5	0	19	57	8	16
	0	0	72	14	14
	3	17	30	20	30
	0	0	38	54	8
6	22	62	8	3	5
	10	33	43	4	10
	17	57	10	3	13
	4	65	19	8	4
7	11	59	11	3	16
	9	48	29	9	5
	20	43	17	3	17
	12	36	12	24	16

«PROBLEM OF FOREST RESOURCE OWNERSHIP»

Results of questionnaire study

<b>№</b>	<b>Question</b>	<b>Group of respondents</b>
<b>1</b>	<b>2</b>	<b>3</b>
1	How do you consider the possibility to preserve the state forest ownership in Russia?	FM professionals
		LA representatives
		FH representatives
2	Transferring forest resources into long-term lease is a step towards private forest ownership.	FM professionals
		LA representatives
		FH representatives
3	How do you consider the possibility to introduce private forest ownership in Russia?	FM professionals
		LA representatives
		FH representatives
4	Diversification of forest resource ownership forms will promote rational use of forest resources and preservation of valuable forest territories in Russia?	FM professionals
		LA representatives
		FH representatives
5	How do you consider the possibility to introduce forest ownership to federation subjects in Russia?	FM professionals
		LA representatives
		FH representatives

Table B.1

of «Opinion on forest resource ownership», %

<b>№</b>	<b>Variants of the answer</b>		
	Agree	Disagree	Don't know
<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
1	87	13	0
	53	38	9
	76	21	3
2	52	48	0
	59	34	6
	48	45	7
3	48	48	4
	44	25	31
	34	59	7
4	56	40	4
	16	56	28
	34	52	14
5	24	72	4
	73	14	14
	48	31	21



Table B.2

**6. How, in your opinion, Karelian forests should be distributed among all forms of forest ownership in case of introducing a diversity of forest ownership forms in Russia?**

Forms of ownership, %	Respondent group		
	FM professionals	LA representatives	FH representatives
1. Federal state forest ownership	50	26.2	54.2
2. Forest ownership of federation subjects	28	32.2	24.7
3. Private forest ownership	8.1	4.4	6.9
4. Forest ownership of local administration	5.4	27.8	6.5
5. Forest ownership of non-commercial organizations	4	1.2	3.2
6. Forest ownership of commercial organizations	4.5	8.2	4.5
<b>In all</b>	100	100	100

«PROBLEM OF FOREST CONSERVATION»

Results of questionnaire study

№	Question	Group of respondents
1	2	3
1	Any kinds of cuttings are prohibited on 2 % of Karelian territory.	FM professionals
2	Main problem of ecological NGO is the low professionalism followed by high self-conceit.	FM professionals
3	Places of inhabiting «Red Book» plants and animals are officially allocated on the territory of your enterprise.	FM professionals
4	Ecological NGO engaged in forest conservation are carrying out their activities in Karelia.	FM professionals
5	It is necessary to increase area of SPNT with interdiction of any cuttings up to 7 % of Karelian territory in order to conserve valuable forests.	FM professionals
6	Nature-conservation policy of RK promotes conservation of Karelian valuable forests.	FM professionals
7	It is necessary to the Government of RK to establish water-protecting zones along all rivers, streams and lakes, irrespective of their size.	FM professionals
8	Ecological NGO activities promote conservation of Karelian valuable forests.	FM professionals
9	Forest management plans, passed state ecological expertise are being used at your enterprise.	FM professionals
10	Young stands cover 39 % of all stocked lands in Karelia.	FM professionals
11	More than 80 % of cuttings on the territory of your enterprise are clear-cuttings of final felling.	FM professionals
12	Is it necessary to legislatively divide Karelian forest fund onto zone with mandatory artificial reforestation and zone with assisted natural regeneration?	FM professionals
13	Is it necessary to cancel fines charged for leaving non-commercial broad-leaved trees in harvesting sites in Karelia?	FM professionals

Table C.1

of «Opinion on forest conservation», %

№	Variants of the answer				
	Completely agree	Agree	Disagree	Completely disagree	Don't know
4	5	6	7	8	9
1	48	40	12	0	0
2	24	36	20	0	20
3	8	40	36	4	12
4	8	60	24	0	8
5	24	52	16	0	8
6	0	40	44	8	8
7	28	40	32	0	0
8	12	52	16	4	16
9	4	24	48	4	20
10	0	48	12	0	40
11	4	56	36	4	0
12	12	40	44	0	4
13	8	16	52	24	0



### «EXPERTISE IN RUSSIAN FORESTRY»

Project «Expertise in Russian forestry» produces information on the forest sector and timber trade in Russia for enterprises, organizations and state management bodies of the forest sector of Finland. Project offers its information services through information offices in Joensuu and Kajaani. Moreover, the Internet-service ([www.idanmetsatieto.info](http://www.idanmetsatieto.info)) and publications are available.

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NOTIONS ON FOREST SECTOR OF THE REPUBLIC OF KARELIA  
(on the official data and results of a questionnaire study)

Monograph

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