Poland

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Summary

1989 was a breakthrough for the entire forest services sector and forest product processing in Poland, after which significant ownership and structural changes have occurred. Apart from and, frequently, in place of some scores of large companies, a significant number of small and medium-sized firms have emerged.

Development of entrepreneurship in the Polish forestry sector is determined by the following:

- Ownership structure of resources – nearly 80% of forests remain under the administration of the National Forest Holding “State Forests”.
- High fragmentation of private forest ownership. Forest area per owner is 1.24 ha.
- Domination of Polish timber market by one supplier of round wood. Timber harvesting in State Forests accounts for about 95% of total domestic harvest.
- Self-sufficiency of Polish timber market - nearly all harvested timber is used by the home market. Imports and exports remain on a similar level (1-2%) and practically do not affect timber balance. This applies to a great extent to non-wood forest products.
- Significant dispersion of the sawmill industry with a large and ever changing number of small and very small enterprises featuring a small scale of production
- High percentage of gray economy in services and processing industry.

- In rural areas, the entrepreneurial sector is a very important source of living and revenues.

Little research has been carried out on entrepreneurship and consumer studies in the forest products sector. Also lack of complete statistical data on the market which is in the making and undergoes transformations creates a problem.

1. Consumption

1.1. State of the art and historical development

There are two major factors that influence the development of the timber sector's potential in Poland: availability of raw material resources and demand for timber products.

Polish timber market is relatively self-sufficient. Nearly all the harvested timber is used by the home market, while imports and exports remain, according to the official statistics, on a similar level and do not exceed 1-2% of the timber consumed by Polish economy. The National Forests Holding "State Forests" is the main supplier of timber to the home market with its 26-28 million cubic meters, which corresponds to 95% of domestic harvest. While private forests cover nearly 20% of total forest area in Poland, they are not an essential source of round wood. High fragmentation of private forest ownership (average private forest area is roughly 1 ha) practically makes it impossible to assure homogeneity and continuity of supplies. However, the existence of one large timber supplier arouses suspicion of it exercising a too strong influence on the domestic market. Besides, large recipients, referred to as strategic, are, in the opinion of small and medium-sized sawmill enterprises, being treated on preferential terms.

The internal timber market balance situation in Poland may soon become unsteady. Over the past two years (2003-2004) a significant increase in the demand for raw material has been observed while the possibility of meeting this demand by the national timber base has become ever worse.

The socio-economic and systemic transformations which started in Poland in 1989 have resulted in a dynamic increase in the number of entities operating in the timber market, particularly in the sawmill industry and furniture making. The sudden growth in the number of economic entities operating in the same market segments has entailed higher supply of products in Poland. Given the rather poor demand potential of the domestic market, more and more Polish firms extend their operations to foreign markets. It results not only from the saturation of the domestic market that significantly reduces the sale of products in Poland, but also from the possibility to obtain higher prices in foreign markets and higher certainty of receiving payments for the delivered goods or services.

Polish timber market belongs to dispersed sectors, with the exception of wood-based panels industry and, partially, the furniture industry. Sawmills and, to a great extent, also the furniture-and upholstery-making factories are located in small towns and rural areas. They are very frequently the only employers in the area; their collapse entails rapid unemployment growth. However, setting up new wood-processing factories in these areas requires significant financial outlays.

1989 was a breakthrough also for the non-wood products and forest services. That year, large monopolist groups ceased to exist and operate and were replaced by the diversified private sector. At the beginning of 1990's, tapping of resin, for decades one of the main non-wood products, was abandoned as a result of profitability decline. Like in other countries, other forest services (tourism, recreation) are becoming more and more important. Also the food industry – purchase and processing of berries and mushrooms, gain importance. Many modern companies deal in this sector. Some of them are exporters.

1.2. Forest products' and services consumption

Poland's population as of 1 December 2003 amounted to 38.2 million. For several years this number has been decreasing as a result of negative demographic growth and, to a lesser extent, negative migration balance.

Urban population stated as a percentage of total population of the country (urbanization ratio) as of 31 December 2003 remained at 61.6%. The period of several decades that followed the end of the war saw a distinct increase of this ratio, from 31.8% in 1946 to 57.5% in 1978. At the end of the 1980's and in the 1990's, this process halted. In 1990 it was 61.4% in 2002- 61.8%. Between 2002-2003 a slight downturn was noted . This phenomenon is typical for most of the European countries. In Poland, it is the result of the impact of two factors: higher decline of the demographic growth ratio in towns and villages and decline of the positive balance of migration from villages to towns.

Gross Domestic Product After the economic downturn in 2001-2002, GDP grew in 2003 by 3.8%, and the forecasts by experts for 2004 are optimistic, as they foresee a 5-6% growth of GDP. The value of GDP per capita in 2000-2002 was estimated at the current (24 September 2004) official mean rate of exchange at USD 5,574 or EUR 4,540.

Composition of household expenses in 2002 was as follows (from highest to lowest): the rent and energy supply 24.6%, food and beverages 20.3%, transport 10.6%, recreation and culture 7.0%, alcoholic drinks and tobacco products 6.5%, health 4.7%, appliances and furnishings and running a household 4.5%, clothing and footwear 4.5%, communications 3.2%, restaurants and hotels 3.0%, education 1.5%, other goods and services 9.6%. The rent and energy supply, communications, health and education have shown the highest rate of growth over the past two years.

Age structure in Poland. In 2003, people in pre-productive age accounted for 21.9%, in productive age-62.9%, in post-productive age-15.2% of Poland's total population. A decline in the size of pre-productive age population is observed as a result of low natural increase (baby-bust). At the same time, a very high increase in the productive-age population is noted. It is one of the highest in Europe. However, Poland has Europe's lowest employment ratio in the productive age population category. In 2003, it was 51.7% with the unemployment rate exceeding 20%. The population ageing process is progressing as a result of baby bust and average lifespan growth.

Taking national consumption into consideration, the following factors may have impact on the development of enterprises in the forestry sector:

- Halting of the country's population growth; population ageing .
- Halting of the urban population percentage growth, or even decline over the past two years.
- High rate of growth of expenses for the use of a flat and for energy carriers in the structure of household expenses
- Improvement of the country's economic growth indicators in 2003 and very good prospects for the upcoming years.

1.3. Market demand for forest related products and services by urban population

Individual sectors of the wood-processing industry, like the timber industry and the pulp industry, are the main market for the domestic raw wood. The main directions of raw wood-processing include sawing, chipping and round form. The foreign buyers' requirement has little impact on the raw materials market in Poland.

In the period of 1999-2003, global consumption of raw wood (domestic + exports) was between 24,8 and 30.6 million m^3. Demand on medium-sized timber was dominant. Specifically high demand on this assortment started in 2001. The analysis of raw wood consumption shows that consumption of large-sized timber declined from 45.5% to 39.4% in favor of medium-sized timber which grew from 50.7% to 56.7%. It also should be noted that after the falling consumption of small-sized timber in the first four years of the period under study, 2003 saw its growth to 3.9%.

Manufacturers of sawnwood are the dominant consumers of raw wood (large-sized timber and, to a greater and greater degree, medium-sized timber). In the period of 1999-2003, 13.5-17.1 million m^3 of raw wood was used for the production of these materials. During that time, 5.3-6.5 million m^3 of raw wood went to wood-based panels manufacturers and 4.2-4.5 m^3 to fiber pulp production. Due to the restructuring of the hard-coal industry and the falling mining production, there has been reduced market demand on the pitwood designed for mines. On the other hand, the fuel wood and small timber market is practically balanced. Fuel wood is used primarily for energy purposes and partially for the production of pallets, while small timber – basically for energy purposes.

A huge progress in production technology and assortment structure occurred in the wood-based panels industry thanks to complete privatization and significant involvement of foreign capital. It resulted in the manufacture of new products (MDF boards and OSB boards). For years, Poland is Europe's biggest producer of fiber boards and ranks among the first ten in the production of particle boards.

The furniture industry, basically privatized, is a sector featuring the highest production rate. Solid wood, mainly for housing purposes, prevail in the production structure. Exports play a very important role in this sector. It stimulates the development of technology and pattern designing. This sector is very modern thanks to the involvement of foreign capital.

The domestic sawmill industry has only partially utilized the possibilities created by the economic system transformation. Hence, its difficult financial situation. It makes it impossible to modernize sawmills and to apply state-of-the-art timber sawing and drying technologies. Commercial sawnwood is the primary assortment of production.

In the pulp and paper industry, the privatization process has been completed. Thanks to foreign investments, this industry has the world's leading, modern pulp and paper production technology.

Tables 1 and 2 and Figure 1 show data on the production, exports, imports and consumption of timber and wood-based products. It should be noted that consumption of timber products *per capita* in Poland is very low in comparison with other European countries. There are practically no data on the current market studies concerning demand on timber. However, taking into consideration the dynamic growth of furniture and wood-based panels exports, there are many signs showing that it can now significantly exceed the possibilities of the domestic raw wood material base.

Problematic is also determination of at least approximate number of economic entities operating in the wood-processing industry. Official statistics include businesses with over 49 employees, while most of the economic entities in the sawmill industry are small or very small firms employing less than 9 people.

Table 1. Manufacture of forest products 1994-2002

	Units x1000	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Roundwood	Cum	18776	20350	20286	21731	23107	24268	26025	25016	27137
Industrial Roundwood	Cum	16711	18939	18823	20193	21793	22842	24489	23375	24995
Sawlogs and Veneer Logs	Cum	9268	9337	9343	9875	10147	10946	11609	10393	10620
Pulpwood and Particles	Cum	6477	7329	7284	8269	0	0	0	0	0
Other Indust Roundwd	Cum	966	2273	2196	2049	2349	1995	1892	1676	1775
Wood Fuel	Cum	2065	1411	1463	1538	1314	1426	1536	1641	2142
Wood Residues	Cum	1950	485	513	689	1024	1312	1691	1807	1960
Sawnwood	Cum	5300	3842	3747	4214	4320	4137	4262	3083	3180
Sawnwood (C)	Cum	4500	3065	2856	3450	3538	3349	3532	2478	2574
Sawnwood (NC)	Cum	800	777	891	764	782	788	730	605	606
Wood-Based Panels	Cum	1987	2434	2653	3167	3809	4036	4615	4598	4894
Veneer Sheets	Cum	12	36	39	42	45	48	58	68	72
Plywood	Cum	124	164	173	226	178	223	261	242	261
Particle Board	Cum	1336	1584	1788	2118	2474	2616	3031	2937	3111
Fiberboard	Cum	515	650	653	781	1112	1149	1265	1351	1450
Wood Pulp	Mt	842	879	877	884	954	912	994	977	1025
Mechanical Wood Pulp	Mt	98	112	101	99	113	126	103	99	102
Semi-Chemical Wood Pulp	Mt	100	96	88	78	95	85	140	125	139
Chemical Wood Pulp	Mt	599	625	645	664	722	698	751	753	784
Dissolving Wood Pulp	Mt	45	46	43	43	24	3	0	0	0
Other Fibre Pulp	Mt	1	0	0	0	0	0	0	0	0
Recovered Paper	Mt	169	437	535	688	663	717	778	815	874
Paper and Paperboard	Mt	1326	1477	1528	1660	1718	1839	1934	2086	2342
Newsprint	Mt	68	95	86	80	92	149	211	211	217
Printing +Writing Paper	Mt	336	389	431	485	502	518	379	548	516
Other Paper +Paperboard	Mt	922	993	1011	1095	1124	1172	1344	1327	1609

Source: Web site FAO Forestry

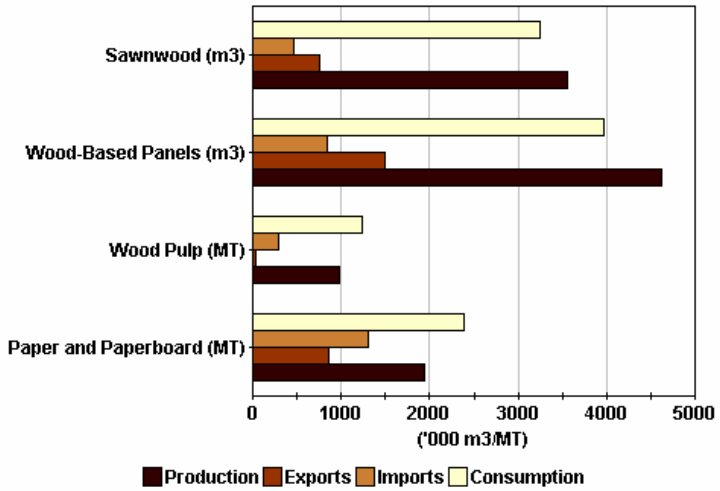

Figure 1. Manufacture, Trade and Consumption of Forest Products in 2002

Table 2. Trade of Forest Products in 2002

		Import		Export		Production	Consumption
	Units	Quantity thousand	million $US	Quantity thousand	million $US	Quantity thousand	Quantity thousand
Sawnwood	Cum	495.8	84.6	788.6	138.0	3180.0	2887.2
Sawnwood (C)	Cum	257.1	30.8	560.7	73.5	2574.0	2270.4
Sawnwood (NC)	Cum	238.7	53.8	227.9	64.5	606.0	616.8
Wood-Based Panels	Cum	946.3	239.1	1609.8	392.7	4894.0	4230.5
Veneer Sheets	Cum	21.6	33.9	16.2	30.1	72.0	77.4
Plywood	Cum	75.4	34.9	137.5	77.1	261.0	198.9
Particle Board	Cum	553.9	65.8	728.6	123.9	3111.0	2936.3
Fibreboard	Cum	295.4	104.5	727.5	161.6	1450.0	1017.9
Wood Pulp	Mt	367.4	163.5	28.5	11.0	1025.0	1363.9
Mechanical Wood Pulp	Mt	0.9	0.4	0.0	0.0	102.0	102.9
Semi-Chemical Wood Pulp	Mt	5.0	1.9	0.0	0.0	139.0	144.0
Chemical Wood Pulp	Mt	359.4	160.0	28.5	11.0	784.0	1114.9
Dissolving Wood Pulp	Mt	2.1	1.2	0.0	0.0	0.0	2.1
Paper and Paperboard	Mt	1475.0	1045.0	1124.8	688.9	2341.9	2692.1
Newsprint	Mt	63.8	33.4	95.0	35.2	217.0	185.8
Printing + Writing Paper	Mt	575.2	439.2	317.0	265.1	516.0	774.2
Other Paper +Paperboard	Mt	836.0	572.4	712.8	388.6	1608.9	1732.1
Roundwood	Cum	726.6	30.6	723.3	39.4	27137.0	27140.3
Industrial Roundwood	Cum	726.4	30.5	676.4	36.6	24995.0	25045.0
Wood Fuel	Cum	0.2	0.1	46.9	2.8	2142.0	2095.3
Wood Residues	Cum	1.8	0.3	104.5	7.4	1960.0	1857.3
Other Fibre Pulp	Mt	4.4	2.9	0.0	0.0	0.0	4.4
Recovered Paper	Mt	28.7	2900	59.4	6.8	874.0	843.3

Source: Web site FAO Forestry

Unfortunately, due to the lack of data, in most of the cases it is not possible to estimate non-wood product consumption by common methods. There are no data on imports and/or exports for most of the categories. Complete data for the period of 1999-2001 are published by GUS with regard to forest berries and fruits (Table 3).

Table 3. Consumption of forest berries and fruits

Years	Units	Import		Export		Production	Consumption
		Quantity	$US (x1000)	Quantity	$US (x1000)	Quantity	Quantity
1999	tons	1760	1737	1600	2457	11280	11440
2000	tons	2689	3818	1947	2878	10127	10869
2001	tons	2057	1317	1239	2444	8745	9563
2002	tons	3438	2354	2454	4096	15062	16046

1.4. Main problems and research questions in consumption for enterprise development

Lack of statistical information, particularly related to private sector.
Wide-range wood substitution and competition, especially on the part of grey economy which brought about a decline in price of sawnwood and other wood products.
High fragmentation of private forests.
Lack of market analyses with the account especially taken of the demand (consumers).
High timber price and supply-related problems.
Low income level of the population in comparison with timber products. Increasing costs of flat use and energy carriers in the total household expenses.
Lack of co-ordinated promotional actions in favour of timber products, business slump in the mass-scale housing industry, lack of instruments to augment the availability of flats.
Lack of research and knowledge about the developing area of non-wood forest services.

Annex A: Organisations studying forest products' consumption and main publications and information sources.

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2. Small-scale forestry practises

2.1. State of the art and historical development

Because of high fragmentation of forests and relatively small forest coverage, as well as few organised forms of its activity, the private forest sector has yet not been the subject of detailed studies. To a small extent, it is the subject of monitoring – for public statistics. Data on private forest holdings being part of rural farms are gathered during Farm Censuses (the recent one held in 2002). Apart from the general data concerning forest area, the level of timber harvest or the number of forest owners, there is no detailed information about economic importance of private forests.

The share of private forest area in total forest area in Poland is, at present, 16.8%, and of natural persons' forests – 15.7%. The share of private forests in the country's forest cover amounts to 5.2%.

2.2. Small-scale forest holding

a) The historical conditions of development of private forest property have led to a situation that there is no tradition in Poland for forest owners to form associations. The first associations of forest owners were formed in 2002. However, there have been so called land communities operating on 68 thousand ha in Poland (see Table 4). One of the largest and best run land associations is Wspólnota Lesna Uprawnionych 8 Wsi in Witów, composed of 8 villages, operating over the area of nearly 3,100 ha of forests.

Up to now there are almost 1,600 land communities in Poland.

b) As per the status at the end of 2003, there have been only 4 associations of private forest owners in Poland. The exact area of the forests owned by them is unknown, however it by no means exceeds 500 ha.

c) Lack of calculations concerning private forests. The total share of forestry in GDP amounted to 0.34% in 2002 (from GUS data). Basing on the volume of harvested merchantable timber it can only be estimated that the share of private forests in GDP does not exceed 0.02%.

d) From the available data on private forest owners, only their education status and age are known (see Tables 4 and 5). Other sociological data are missing.

Table 4. Education status of private forest owners

	Education level in % total	
	forest area	number of forest holdings
university	5.5	4.0
post-secondary	1.4	1.5
secondary vocational	17.8	16.9
secondary	2.5	2.6
primary vocational	35.8	36.1
primary completed	34.4	35.8
primary not completed	2.5	3.0
unknown	0.1	0.1
total	1,037,547 hectares	773,188 holdings

Table 5. Age of the forest owners

	Age of the user in % total	
	forest area	number of forest holdings
up to 25 years	3.1	2.9
25 - 34	15.7	15.2
35 - 44	28.6	27.4
45 - 64	42.6	42.5
65 and older	10.0	12.1
unknown	0.0	0.0
Total (absolute values [ha/owner])	1,037,547	773,188

e) In 2001, 1153 thousand cubic meters of merchantable timber were harvested in private forests, which accounts for 4.6% of total merchantable timber harvested in Poland (from GUS data).

f) Non-wood products harvested in private forests should include, like in the case of state forests, forest floor fruit and mushroom, ornamental and Christmas trees. However, there are not even rough estimations of the volume and value of non-wood products harvested in private forests. The volume and value of forest floor products is estimated proportionally to the share of private forest area in total forest area and can amount to 1,887 tons of berries, forest floor fruit and fresh mushroom worth PLN 8.309 thousand. With reference to 1 ha of forest area, we have 1.30 kg of forest floor products per ha worth PLN 6. It is noteworthy, that the purchase of forest floor products is very strongly differentiated regionally (see Table 6.) and in spite of its low estimate values, it is of great importance for the inhabitants of rural areas as their additional, seasonal source of income.

g) It is hard to determine the significance of private forestry for tourism and recreation, first of all due to the high fragmentation of holdings . For sure, forests are a great attraction for agro-tourist farms. The importance of private forests in this context can be seen as of ***low significance***.
h) 16 regions (provinces) are strongly differentiated in terms of private forest resources (see Tables 6 and 7). Geographical distribution of private forests is uneven. Much more private forests are in the eastern and southern parts of Poland than in the western part. In the: Małopolskie, Mazowieckie, Lubelskie and Podlaskie Provinces there are as many as 914.4 thousand ha of private forests, which account for 59.2% of the total area of private forests in Poland.
i) No privatisation/restitution of forests is being conducted in Poland.

Table 6. Characterisation of private forests

Province (Voivodship)	**Number of private forest holdings**	**Harvest level of merchantable timber [‘000 m^3]**	**Total afforestation in individual farms in 1992-2000**	**Volume and value of forest floor products purchased in 2001 r.**	
	2002	**2001**		**tones**	**‘000 PLN**
1	**2**	**5**	**3**	**4**	**5**
Poland	**838,608**	**1153.2**	**77,393**	**12,021.0**	**52,925.2**
Dolnośląskie	12,956	10.7	1,856	90.0	535.9
Kujawsko-Pomorskie	16,615	32.2	3,289	267.0	919.0
Lubelskie	130,841	192.4	7,188	2,945.0	6,894.8
Lubuskie	5,022	12.3	668	260.0	1,545.2
Łódzkie	73,988	75.8	9,001	198.0	694.8
Małopolskie	120,699	198.3	4,207	130.0	512.3
Mazowieckie	147,375	126.1	13,673	962.0	4,255.3
Opolskie	7,917	9.8	415	0.0	0.0
Podkarpackie	83,225	100.5	7,878	635.0	1,229.8
Podlaskie	66,202	84.5	5,960	1,312.0	7,902.2
Pomorskie	16,746	64.9	3,563	1,744.0	7,280.7
Śląskie	47,201	85.2	2,738	27.0	123.6
Świętokrzyskie	54,180	61.7	5,493	374.0	975.4
Warmińsko-Mazurskie	15,869	35.9	3,631	273.0	883.1
Wielkopolskie	33,276	54.4	6,822	1,759.0	16,097.9
Zachodniopomorskie	6,496	8.5	1,010	1,045.0	3,075.2

Table 7. Forest areas in Poland by provinces (as of 31.12.2001 according to GUS - Central Statistical Office)

Province (Voivodship)	Area of forests		Area of private forests, incl.:			Share of private forests
	total	private	natural persons	land associations	other *	
	1000 ha		ha			%
Poland	**9088.5**	**1544.9**	**1,447,464**	**68,194**	**29,279**	**16.8**
Dolnośląskie	579.6	12.8	11,311	0	1,459	2.1
Kujawsko-Pomorskie	416.5	43.0	40,842	565	1,609	9.8
Lubelskie	565.5	214.2	203,642	9,568	1,004	37.2
Lubuskie	693.6	7.8	6942	5	854	1.1
Łódzkie	380.8	119.9	112,887	6,256	749	31.1
Malopolskie	434.2	185.9	167,159	14,548	4,221	42.8
Mazowieckie	793.6	329.2	315,766	10,327	3,062	40.9
Opolskie	253.0	10.6	9566	5	988	4.2
Podkarpackie	661.3	95.0	84,961	7,585	2,479	14.2
Podlaskie	605.6	185.1	179,555	4,290	1,262	30.5
Pomorskie	667.4	67.5	65,936	45	1,488	10.0
Śląskie	397.8	76.8	68,146	7,184	1,454	19.3
Świętokrzyskie	320.7	79.4	71,851	6,965	695	24.7
Warmińsko-Mazurskie	736.0	33.8	31,635	105	2,038	4.4
Wielkopolskie	772.4	75.1	70,653	746	3,681	9.4
Zachodniopomorskie	810.3	8.8	6612	0	2,236	1.0

*co-operatives, churches, private firms, voluntary organisations

2.3. Small-scale forestry practices

a) Small-size forestry with the average forest holding area of 1.43 ha is dominant. Forests are, to a great extent, part of agricultural farms. Forest economy, if such exists, is most frequently focused on timber production. Because of a small average farm area, recreation and non-wood products are of no significance.

b) There is an association of private forests with agriculture as a result of allocation of a large area of farmland, excluded from agricultural production, for afforestation, as well as due to the fact that a forest frequently is part of a rural farm, being a source of wood for household purposes.

c) The extent of works carried out in private forests is shown in Table 8. In private forests, simplified forest management plans are being drawn up. They are the main source of information about the condition of these forests. This simplification (of plans) is considerable in comparison with the State Treasury's forests and concerns mainly the scope of forest inventory and the precision of determining the individual components of forest appraisal. In private forests, no soil-site-related works are being carried out, estimation methods are being used to determine stand volume, the scope of the described forest appraisal components is lower than in the State Treasury's forests, the activities undertaken to identify protective forests and forests in damage zone are minimal (no such a possibility has practically existed until 1991). The carried out large-scale inventory (including health and sanitary condition of forests, damage caused by game, damage zones) did not cover private forests. We should add to this the lack or loss of validity of forest management plans (see Table 9) on part of this ownership category forest areas. Annual updating of forest area and volume by dominant species and age classes is not being

conducted for private forests. The statistical data concerning management activities performed are just approximations.

Table 8. The scope of basic activities in private forests in 2002

Province (Voivodship)	Private forests	Management activity in ha			
		Reforestation	Afforestation	Forest tending	Timber harvesting
Poland	**1544.8**	**2886**	**11315**	**16241**	**1,153,236**
Dolnośląskie	12.8	53	214	127	10,658
Kujawsko-Pomorskie	43.0	120	470	960	32,197
Lubelskie	214.2	238	1328	2761	192,377
Lubuskie	7.8	32	27	142	12,342
Łódzkie	119.9	167	1347	1463	75,810
Malopolskie	185.9	520	664	2139	198,301
Mazowieckie	329.2	469	2416	2191	126,110
Opolskie	10.6	30	102	147	9,752
Podkarpackie	95.0	268	633	1676	100,538
Podlaskie	185.1	238	781	862	84,519
Pomorskie	67.5	225	358	921	64,906
Śląskie	76.8	178	176	377	85,234
Świętokrzyskie	79.4	109	972	505	61,671
Warmińsko-Mazurskie	33.8	92	860	797	35,869
Wielkopolskie	75.1	141	962	1153	54,437
Zachodniopomorskie	8.8	6	5	20	8,515

Table 9. The share of forests possessing updated management plans and recognised as protective in 2002

Province (Voivodship)	Private forests in thousand ha	% of forests possessing updated management plans	% forests qualified as protective
Poland	1544.9	65.7	5.3
Dolnośląskie	12.8	86.7	5.4
Kujawsko-Pomorskie	43.0	94.3	2.8
Lubelskie	214.2	59.6	0.4
Lubuskie	7.8	85.8	1.2
Łódzkie	119.9	90.3	0.4
Malopolskie	185.9	51.7	8.6
Mazowieckie	329.2	50.8	6.5
Opolskie	10.6	85.2	14.8
Podkarpackie	95.0	77.8	10.5
Podlaskie	185.1	72.1	5.7
Pomorskie	67.5	78.7	0.5
Śląskie	76.8	51.7	20.1
Świętokrzyskie	79.4	78.9	2.2
Warmińsko-Mazurskie	33.8	46.1	1.0
Wielkopolskie	75.1	85.8	1.2
Zachodniopomorskie	8.8	61.4	2.9

d) Data will be available on the basis of random sampling of forest holdings by the end of 2004.

e) Examples of forest associations: Słopnickie Association of Private Forest Owners (25 ha, 17 members, fee PLN 1/month), Zawojskie Association of Private Forest Owners (150 ha, 70 members, fee PLN 3/month).

f) All the data presented below are based on the research carried out in 2004 in private forest farms on a representative random sample of 520 agricultural farms with forests. For information about the volume of consumed timber for farmers' own needs – see g)

g) While trying to determine the annual costs (in 2003) encumbering forest management, a total of cost components was calculated, such as: purchase of materials and energy, as well as taxes and fees (Table 10). Such cost components were determined for 237 farms for a total value of PLN 96,116. The farms had 1,114 ha of forests and harvested 6,610 m^3 of wood in the period between 2001-2003. The burden per unit of area and harvested timber was PLN 86/ha and PLN 43/m^3

Table 7. Cost structure of surveyed forest farms in 2004.

Expense category in 2003	**Value of expenses [PLN]**	**number of farms**
- purchase of forest lands	5,900	5
- lease of forest lands	2,442	4
- purchase of machinery and equipment (e.g. sawing machines, brushcutters, etc)	81,755	78
- purchase of materials and energy (e.g. purchase of seedlings, pesticides)	88,067	258
- fees for hired labor in forests (remuneration for the persons working in forests – soil preparation, haulage of timber from forests, aforestation and tending treatments)	21,911	39
- taxes and fees (forest tax, land classification fee, etc.)	41,222	445

The amount of revenues from the sale of timber raw material in 34 farms reached nearly PLN 70 thousand. Nearly 806 m^3 of timber were harvested in these farms in 2003. The average unit price per m^3 of timber was PLN 86 per $m^{3.}$ The sale of timber was for each of the 34 farms a source of revenue valued at PLN 2,058 on average. The revenues thus obtained oscillated from PLN 100 to 10 thousand. Revenues from the sale of timber raw material of 34 farms was generated on the area of 287 ha of forests - each hectare of forest generated revenue of PLN 243 (Table 11).

The value of timber raw material used for individual needs of farm owners valued at PLN 365 thousand was nearly five-fold higher than the value of sold timber. The value of timber used first of all for the needs of a farm and as fuel was estimated by 360 farms – the average value of timber raw material used for a farm's own needs amounted to PLN 1.015. The volume of the timber harvested in 2003 amounted to 4,052 m^3. The value of one cubic meter used in the surveyed farms was estimated by the polled persons at PLN 90. Those farms which estimated the value of timber used for their own needs operate on the area of 1,445 ha of forest.

Table 11. The value and structure of revenues from the sale and from the use of timber for farms' own needs

Source of revenues in 2003	**Value of revenues [zł]**	**N**	**% of revenues**
- from the sale of felled wood or growing stock	70,000	34	15.57
- estimated value of felled wood in the owned forest used for household needs (fuel, construction, etc.)	365,470	360	81.28
- in the form of a money equivalent for forest management	14,180	6	3.15
total	449,650	400	100.00

h) See above.

i) The percentage of revenues related to forest management and wood-processing is not insignificant. Revenues from the sale of timber account for 1.5% of **total** value of revenues, while those related to the sale of timber from one's own forest, not in round but processed form, account for merely 0.2% of that value (Table 12).

Table 12. Revenue structure of agricultural-forest farm

Revenue structure in 2003	**[%] of total revenues**	**N**	**% of a sample**
- running an agricultural farm	31.8	277	53.26
- sale of timber from one's own forest	1.5	37	7.11
- sale of processed timber (boards, stakes, pallets, etc.) from one's own forest	0.2	7	1.35
- hired labor, old age and disability pensions	44.4	279	53.65
- other sources (to be named).	22.1	150	28.85
-total	100%	-	-

j) Lack of information.

k) Farmers' communities occur in 396 communes; among 1,632 which turned in the completed questionnaires (there is a total number of 2,467 communes in the country) there are 1.316 agro-forest communities with a total area of 76,606 ha, including 40,447 ha of forests.

l) A great part of the surveyed farms declared performance of harvesting works and haulage of timber from their forests by their own means, with the help of their families. In the case of wood felling – 413 persons were questioned, in the case of haulage – 405 persons (Table 13).

Table 13. Family and neighbour assistance in felling and haulage of wood from forests in the surveyed agricultural-forest farms in 2004.

activity	**felling**	**haulage**
I do it myself with the assistance of my family	413	405
I do it myself with the assistance of my neighbors	20	23
I hire labor against payment	25	29

2.4. Policy framework and production conditions

a) Institutions

- Ministry of the Environment,
- State Forests National Forest Holding,
- National Fund for Environmental Protection and Water Management,
- Provincial Funds for Environmental Protection and Water Management.

Legal acts

- Act of 29 June 1963 on land communities management (Dz. U. No. 28, item. 169);
- Land Survey and Cartographic Law Act of 17 May 1989 (Dz. U. No. 30, item 163 with further amendments);
- Act of 7 April 1989 concerning associations (Dz. U. No. 20, item 104);
- Forest Act of 28 September 1991 (consolidated text Dz. U. of 2000 No. 56 item 679 with further amendments);
- Act of 16 October 1991 on nature conservation (Dz. U. No. 114, item 492);
- Act of 3 February 1995 on the protection of agricultural and forest land (Dz. U. No. 16, item 78);
- Environment protection Law Act of 27 April 2001 (Dz. U. No. 62, item 627);

Regulations:

- of the Minister of the Environment of 28 December 1998 on detailed principles of preparing forest management plan, simplified forest management plan and forest inventory (Dz. U. z 1999 No. 3, poz.16);
- of the Minister of the Environment of 24 February 1998 on detailed principles of timber marking, the patterns of marking equipment and of their use, as well as samples of documents concerning the legality of harvest (Dz. U. No. 36, item 201 z 1998 with further amendments);
- of the Minister of the Environment and the Minister for Internal Affairs and Administration of 16 August 1999 on detailed principles of protection against forest fires (Dz. U. No. 73, item 824 z 1999).

a) Legal instruments:

- Forest Act of 28 September 1991 (Dz.U. No. 101, item 444 with further amendments),
- Act of 16 October 1991 on nature conservation (Dz. U. No. 114, item 492);
- Act of 3 February 1995 on protection of agricultural and forest land (Dz. U. No. 16, item 78);

b) Economic instruments – financial and expert support:

- protective measures against the occurrence of harmful biotic agents to a degree that threatens the sustainability of forest (at the expense of forest districts staying within the organisational structure of the State Forests),
- management and protection of forests connected with the renewal and restructuring of a stand in the case of forest damage arising as a result of the impact of industrial gases and dusts, or natural disaster caused by fires and other biotic and abiotic threatening the sustainability of forests (the costs are covered from the State budget),
- coverage, in part or in full, the expenses for the afforestation of land (financed from the State budget),

- cash equivalent for afforestation of post-agricultural land (financed from the State budget),
- preparation of simplified management plans or inventory of forest resources (financed from the State budget),
- in specially-justified cases seedlings of forest trees and shrubs are available free of charge for land afforestation (seedlings are delivered by appropriate forest districts staying within the organisational structure of the State Forests),
- stands up to 40 years are exempt from the forest tax,
- forest tax reduction: protective forests, forests included in nature reserves and National Parks;

c) Ministry of the Environment, Ministry of Agriculture and Rural Development, State Forests National Forest Holding, National Fund and Provincial Funds for Environmental Protection and Water Management.
d) The institute focusing on research of forest environment is the Forest Research Institute in Warsaw. Other institutes carrying out research in this field are: the Institute of Environmental Protection, Institute of Dendrology PAS (Polish Academy of Sciences) in Kórnik, Institute of Ecology PAS in Dziekanów Leśny, Institute of Botany PAS, Mammal Research Institute PAS in Białowieża. Besides worth mentioning are three Forest Departments: Warsaw Agricultural University (SGGW), Agricultural University of Poznań and Agricultural University of Cracow.
e) State Forests National Forest Holding (Promotional Forest Complexes (PFC), Forest Culture Centre in Gołuchów), Agricultural Consultation Centres (ACC), forest secondary schools and universities (forest technical schools, Warsaw Agricultural University (SGGW), Agricultural University of Poznań and Agricultural University of Cracow).
f) State Forests National Forest Holding, National Fund and Provincial Funds for Environmental Protection and Water Management.
g) Act of 28 September 1991 defines the scope and ways of carrying out the supervision. The management of forests that are not the property of the State Treasury is under the supervision of county governors and, to a lesser degree, of Provincial governors. At the same time possibilities have been created to exercise on their behalf some elements of the supervision over forests by chief foresters of forests districts and directors of Regional Directorates of the State Forests.

Pursuant to the Forest Act the above mentioned supervision organs are authorised to exercise rules of law by way of:
1) issuing normative acts concerning:
- ordering protective actions to be carried out in the country,

2) issuing administrative decisions concerning:
- approval of simplified management plans,
- appropriating funds to cover expenses of restructuring of stands arising as a result of the impact of industrial gases and dusts (in the case in which it is not possible to determine the agent responsible for forest damage) or natural disaster,
- transformation of a stand into farmland,
- the ways of dealing the comments on the draft simplified management plan raised by forest owners,

- harvesting of timber which are not in compliance with the simplified management plan,
- ordering to perform the tasks included in the simplified management if a forest owner fails to perform them in the set time,
- determining the scope of tasks in the field of tree cutting, reintroduction of forest vegetation (plantations), stand conversion, tending and protection of forests including protection against fires in forests for which simplified management plans have not been drawn up and in forest complexes of an area up to 10 ha.

3. Wood-processing industries

3.1. State of the art and historical development

The social-economic and political system transformations initiated in our country in 1989 have had a great influence on the changes in the structure of Polish industry and the condition of industrial plants in the new economic realities. In addition to some scores of big incumbent companies, a large number of new small enterprises with a few employees are being set up. Not less dynamic is the development of the sector of middle-sized enterprises in terms of turnover and number of employees.

Nearly 60.5 thousand enterprises were operating in the wood-processing, as well as the pulp and paper industries at the beginning of the 1990's, of which 29.1 thousand- in the wood and wood products industry, 21.2 thousand – in the furniture industry and 2,138 in the pulp and paper industry. It should be noted that a great part of these firms underwent liquidation in a very short time, or changed their production profile, or even their business profile, transforming into service providers or commercial firms. It is hard to precisely determine the total number of business entities processing wood. According to the Central Statistical Office (GUS), there were over 59,400 such entities (including natural persons conducting business) in 2002. Small enterprises (with up to 49 employees) accounted for 99.6% of the total number of wood-processing firms, and the percentage of employees in those firms was 38%. There were 690 entities with over 49 employees which operated in the wood-processing industry in 2002. 326 enterprises were registered in the wood and wood products industry. Furniture production was carried out by 364 enterprises. The total number of employees in the wood-processing industry in 2002 amounted to 143.1 thousand. See Table 14.

In the wood -processing industry, furniture making dominates, with sold production and employment amounting to 57% and 61%, respectively. Next come the following sectors as a percentage in sold production: wood-based panels - (19.3%) and construction joinery - (11.3%). In terms of number of employees, construction joinery and the sawmill industry have a great part, with (12.4 %) and (10.8%), respectively.
Polish wood-processing industry, particularly the sawmill sector, is based on local timber resources and is located in the vicinity of larger forest complexes. The analysis of the regional distribution of sawnwood producers shows that it is concentrated mainly in northern-western Poland.

Table 14. Characteristics of the wood-processing industry in Poland

Specification	**Number of business entities**	**Production**	**Employment**
	593761	PLN 20,4 billion[1]=	143,100 persons[2] =
Wood industry, incl.:		100.0 %	100.0 %
- Sawmilling industry	7 167	6,8	10,7
- Wood-based panels industry	337	19,3	8,0
- Wood construction joinery	16 558	11,3	12,4
- Packaging industry	3 837	1,8	2,8
- Furniture industry	21 343	57,4	61,3
- Others	10 134	3,4	4,8

[1] business entities registered in the REGON system in 2001 in which, according to GUS, about 40% of the information can be out of date (GUS does not monitor the fulfilment of the obligation to update the information in the event of liquidation or change of business profile)
[2] value of sold production and average employment in the firms with 49 employees
Source: a study by Institute of Wood Technology on the basis of GUS data

The wood-processing industry belongs to important sectors of Polish economy. While its share in Gross Domestic Product is about 2%, it employs over 6% of the total number of staff in the industry.

Unfortunately, description of small enterprises in the wood-processing industry is very difficult because of the lack of precise statistical data. Generally available, precise statistical data pertain to enterprises with over 49 employees which, however, account for no more than 0.4%.

3.2. Wood processing industries

Polish **sawmilling industry** belongs to the dispersed sectors, with its numerous, ever changing group of small and very small entities in which production scale is rather low. It is hard to specify precisely the number of sawnwood manufacturers in Poland. According to REGON (status as of 2003), the number of entities in this sector is 8.768. However, the actual number of manufacturers of sawnwood – the main product of the sector – whose operation is rather stable, is 1,100-1,200, of which only 15% have over 49 employees.

According to other sources, 3,091 entities deal with sawing. About 50% of them are handicrafts enterprises, processing less than 1 thousand m^3 of raw material annually. About 1,390 entities, or 45%, are small firms sawing from 1 thousand to 10 thousand m^3 of raw material. 151 plants (5% of total number) saw over 10 thousand m^3 of raw material annually, of which 12 entities are large enterprises processing over 50 thousand m^3 of round wood annually (totally about 20% of total mass). Manufacturers sawing up to 10 thousand m^3 of raw material annually (about 95% of operating firms) purchase about 52% of sold raw material mass, the others (5% of firms) – 48%.

At this point, it should be stated that the number of receivers of round wood could be bigger if we add the manufacturers of goods such as pallets or equipment for gardens. Here, we have a large group of manufacturers processing round wood which is usually

thinner than that purchased by typical sawmills. This group encompasses about 2.5 thousand firms. 25 of them reach the output largely exceeding 50 thousand cubic meters per year. The importance of this segment is reflected in the fact that it processes about 5 million cubic meters of paper wood.

Like in many European countries, the **wood-based panels industry** in Poland features high concentration of the production potential. The manufacturing of wood-based panels, including particleboards, fibreboards and ply wood, is concentrated in a dozen or so bigger plants which all account for 98% of total internal production of these goods. The volume of production of wood-based panels in Poland between 1995 and 2002 is shown in Table 15.

Table 15. The wood-based panels industry in the years 1995- 2002

	Production in thousand m^3							
	Years							
Products	1995	1996	1997	1998	1999	2000	2001	2002
Particleboards	1584	1788	2118	2474	2616	3031	2937	3052
Fibreboards	482	457	487	475	447	497.2	501	550
Insulating boards	186	172	177	186	198	239.2	259	307
Hardboards	296	285	310	289	249	258	242	243
MDF	168	196	294	637	702	768	850	1250
ply wood	164	173	226	178	223	261	242	270
Total	2398	2614	3125	3764	3988	4557.2	4530	5122

Source: GUS

The dynamic development of the production of wood-based panels has been caused by the growing demand for the panels on the home and foreign markets. Poland is a significant supplier of wood-based panels to the European market. Their export in 2002 amounted to 1.6 million cubic meters. About 37% of exported particleboards are OSB boards**.** The share of exports in the production of particleboards is about 22%, while of fibreboards - over 42%.

The products made of wood-based panels in Poland are to a great extent exported. There is a great potential for the development of production and consumption of wood-based panels in Poland.

After a deep technological reconstruction in the **furniture industry** in the 1990's, this sector features a significant growth rate, a high share of exports in the value of sold products and a high level of advancement of the privatisation processes. About 95% of firms are private businesses. The furniture-making industry is one of the most dynamic sectors of Polish economy.

The furniture industry sells about 70% of its products to foreign countries. Therefore, export decides about the economic situation of this sector more than internal demand. The production growth in the furniture sector in recent years has been of the order of 5-6% on average.

The furniture industry sector in Poland is to a great extent concentrated. The twelve largest Polish plants manufacture about 60% of Polish furniture.

Foreign trade plays a significant role in the wood-processing industry, and the export of wood products, particularly of furniture, is of crucial importance for the development of the entire economy. The role of the import of timber products is relatively small for the Polish market – see Table 16.

Table 16. Foreign trade in wood products between 1999 and 2002

Billion PLN

Specification	**Exports**				**Imports**			
	1999	2000	2001	2002	1999	2000	2001	2002
Wood products	11,2	13,3	13,7	15,7	2,9	3,2	3,3	3,6
Dynamics %	-	118,8	103,0	114,6	-	110,3	103,1	109,1
incl:								
Furniture	7,6	9,3	9,9	11,4	1,5	1,6	1,6	1,7
Dynamics %	-	112,4	106,5	115,2	-	106,7	100,0	106,3

[x] previous year = 100%

Source: a study by Institute of Wood Technology on the basis of GUS data

Furniture is the main commodity group in Polish exports. In 2002, furniture accounted for nearly 7% of their value. As far as other timber products are concerned, wood-based panels, mainly particle and insulating boards, play a crucial role in exports (Table 17).

Table 17. Wood products sector in Polish foreign trade

%

Specification	**Share of timber sector products:**							
	Total exports from Poland				Total imports to Poland			
	1999	2000	2001	2002	1999	2000	2001	2002
Wood products industry	3.3	3.0	2.5	2.7	0.8	0.8	0.8	0.8
incl:								
Sawmilling industry	1.1	1.0	0.7	0.7	0.2	0.2	0.2	0.2
Wood-based panels industry	1.0	1.0	0.9	1.0	0.4	0.4	0.4	0.4
Wood construction joinery and carpentry products for the building industry	0.6	0.6	0.5	0.6	0.1	0.1	0.1	0.1
Wood packaging industry	0.3	0.2	0.2	0.2	0.0	0.0	0.0	0.0
Other wood products industry	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1
Furniture industry	7.0	6.7	6.7	6.8	0.8	0.8	0.8	0.8
Total wood-processing industry	10.3	9.7	9.2	9.5	1.6	1.5	1.6	1.6

Note: due to the lack of correspondence between the classification systems in the sphere of production and foreign trade, the value of the export and import of products by sector was estimated according to PKWiU in compliance with Polish Combined Nomenclature of Foreign Trade (PCN), with the exclusion of raw timber.

Source: a study by Institute of Wood Technology on the basis of GUS data

As a result of the economic-organisational changes in forest economy in Poland, a dynamic development of the private services sector has taken place. The emergence of private **forest enterprises (contractors)** conducting business on their own was taking place in two ways. The first one was the initiative of the people wanting to set up a private enterprise, the second was the result of a pressure exercised by the administration on the workers leaving Forest District Inspectorates to set up their own, private enterprises and provide services for a Forest District. This has led to the emergence of a large number of small enterprises employing up to 5 persons.

Generally, between 1992 and 1999 changes in the number of employees were accompanied by the deep changes in the employment structure - the share of supervisory staff in the employment structure doubled, while the number of permanent employees halved. In a move to cut business costs, it is a common practice that private forest firms employ subcontractors. Subcontractors are one-person firms with registered business. Being independent economic entities, they pay all the fees and duties resulting from their business activity. Frequently, in one-person firms whole families work for one person. In multiple-person firms there are cases of illegal employment of a larger number of persons nowhere registered. The number of multiple-person firms has been dramatically reduced with a simultaneous increase in the number of seasonal staff.

3.3. Wood processing industries practices

In 2001, out of a total number of 59.4 thousand entities, 99.8% conducted business in the private sector. There is lack of data concerning the volume of timber (harvested in Poland) processed by small and medium-sized enterprises. It is known, however, that small enterprises with up to 49 employees accounted for 37 % of total number of sales of the wood-processing industry.

Contractors harvest about 95% of total wood harvested in Poland. The number of such firms is estimated at about 8 thousand, of which 50% are one-man firms. As far as the other firms are concerned, most are enterprises with 2-5 employees. It is a common practice that firms hire temporary staff seasonally, or even illegally. Contractors are underinvested. Their main equipment is still a chain saw and a farm tractor, in most cases without additional equipment.

In terms of sold production and number of employees, the following sectors are of the greatest importance: furniture-making – 51% and 53%, wood-based panels –15% and 6%, construction joinery - 14% and 15%, and the sawmill industry - 12% and 16%, respectively.

1993 was a breakthrough year for the Polish wood-processing industry, including the furniture industry. After the phase of economic breakdown, the share of its production in terms of value in total industrial output has gradually increased. In 2000, it stood at 5.8% for business entities with over 9 employees and 5.2% for entities employing more than 49 persons (see Table 18).

Table 18. Wood-processing industry as a percentage of total industry sold production in Poland between 1993 and 2002

%

Specification	1993	1995	1999	2000	2001	2002
The share of wood industry (including furniture industry) in total industrial output						
In business entities:						
a/ with over 9 employees	3.7	4.6	5.9	5.8	5.7	5.8
b/ with over 49 employees	2.9	3.7	5.1	5.2	5.0	5.1

Note: for years 1993 and 1995 the data refer to business entities employing: a/ more than 5 persons; b/ more than 50 persons

Source: Strategy for wood industry up to 2006. MGPiPS. Warsaw 2003

In 2002, the production potential of the wood-processing industry (including the furniture industry) featured a 9.5 per cent share in the export of goods (excluding the export of timber). It should be stated that the economic situation of the wood industry (including the furniture industry) has recently been relatively better compared to the whole industry (see Table 19).

Table 19. Net profitability of wood industry compared to the total industry output in the years 1997-2002

%

Specification	1997	1998	1999	2000	2001	2002	2003[1]
Industry	1.9	0.4	-0.6	0.3	-0.3	0.2	2.4
Processing industry	2.3	1.2	0.1	0.7	-0.4	0.3	2.6
Wood products	2.9	0.5	-0.2	2.0	-0.2	1.4	1.7
Incl.:							
Sawmill products	-1.3	-2.5	-1.6	-1.3	-3.7	-1.0	2.8
Wood-based panels	2.9	-1.2	-3.1	3.6	1.3	2.7	1.1
Wood construction joinery	6.5	5.4	4.6	3.5	1.0	0.8	-0.6
Furniture production	3.1	2.4	2.8	1.2	0.7	2.9	4.2

Notes: 1: first half of 2003.

: in 1997-1998 - business entities employing more than 50 persons, in 1999-2002 more than 49 persons

Source: Szczawińska E. 2003: Możliwości rozwoju małych i średnich przedsiębiorstw przemysłu drzewnego w Polsce [Development potential of small- and medium-size firms in the wood industry sector in Poland]. Conference materials „Leśna przedsiębiorczość", Sękocin 2003

Industrial competitiveness is strongly associated with the state-of-the art products largely reflecting the level of technological advancement of factory equipment and systems, as well as production innovation degree. The new and upgraded products whose manufacture started in 1999-2001 account for 7% of the value of sold production of timber goods and about 24% of sold production in furniture making (Table 20). The downturn in the timber sector has been significant in recent years, while in the furniture sector, after the slowdown in 1998-2000, significant growth, the highest since 1995, was noted.

Table 20. Sold production of new and upgraded products stated as a percentage of total sold production in the wood-processing industry in 1995-2001.

Current prices

Specification	Products whose production started				
	1995-1997	1996-1998	1997-1999	1998-2000	1999-2001
	in % of sold production				
Industry	20.1	20.0	21.3	16.4	18.0
Processing industry:	20.9	22.4	24.7	18.5	20.8
Wood products production	21.4	25.2	23.5	14.0	7.3
Furniture production (incl. other sectors)	16.8	15.3	17.8	10.6	23.6

Notes: in 1996 – 1998 in business entities employing more than 50 persons
in 1999-2001 in business entities employing more than 49 persons
Source: a study by Institute of Wood Technology on the basis of GUS data.

3.4. Policy framework and production conditions

The period after 1989 saw crucial changes in the mechanisms of state functioning in Poland. The first fundamental change was restoration of local governments in rural districts in 1990. Next came the self-governmental and administrative reform introduced on 1 January 1999. On its basis, the number of provinces were reduced from 49 to 16 and the intermediate level between province and commune was introduced. One of the assumptions of the reform was to delegate part of the central level's tasks, that is the responsibility for economic development and regional policy, to the provincial (regional) level. On the other hand, the Government was responsible for strategic functions (co-creation and implementation of State Policy, creation of administrative regulations) and supervisory functions (supervision of agencies and bodies).

Practically, there is no institution that might create a coherent policy for the entire timber sector. There is the Polish Economic Chamber of the Wood-processing industry, however it associates in fact firms operating in the sawmill industry. Nevertheless, we should remember about the Polish Agency for Enterprise Development set up in 2001 which is a very important instrument of the state policy in the area of support for the small and medium-sized enterprises sector.

The main reforms which took place after 1989 include privatisation and re-privatisation process which also extended to the wood-processing industry. At present, no more than 0.2% of firms operating in this sector are state enterprises.

No policy exists concerning exclusively the wood-processing industry. The Sectoral Operational Program "Company Competitiveness Growth" is one of seven operational programs which are being implemented in Poland under the national strategy included in the National Development Plan 2004 – 2006. The program sets the goals, priorities and actions pertaining to the implementation of the policy in favour of development of entrepreneurship and innovation , with a focus on the small and medium-sized enterprises. The main goal of the program, defined as improvement of Polish economy's competitive position, will be fulfilled through implementation of nine actions co-financed by the European Regional Development Fund. Four of them will be implemented by the Polish Agency for Enterprise Development . Unfortunately, as a

result of incorrect interpretation of the regulations, forest contractors have been excluded from this program.

For all the organisational units of State Forests and the forests not belonging to the State Treasury, as well as the forests included in the State Treasury Agricultural Property Resources, forest management plans including, among others, the volume of timber to be harvested, are being drawn up.

An Integrated Regional Development Operational Plan (ZPORR) is being prepared for the period of 2004-2006. It's aim is, among others, to create the conditions for growth of competitiveness between regions, counteract marginalisation of some areas and foster economic, social and territorial cohesion. ZPORR is directed at, among others, local governments and micro-enterprises, as well as people just staring business activity.
The main institutions conducting research in the wood-processing industry include: The Wood Technology Institute and higher education establishments (forest faculties, wood technology faculties, economics faculties).

Higher education in forestry and forest industry is provided by 3 forest and 2 wood technology faculties. Secondary education is offered by forest high schools, as well as wood-processing colleges and high schools.

Practically there are no institutions providing training and consulting for the wood-processing industry. The Educational Center for Forest Entrepreneurs organising courses in forest management and legal-economic issues is the only exception.

3.5. Conclusions: Supporting and limiting factors for enterprise development in wood processing industries and barriers to entrepreneurship

The importance of small and medium-sized enterprises is analysed from the point of view of the provided economic and social benefits. The most frequently mentioned effects include: production, employment, regional decentralisation and capital mobilisation. The better production effect of the capital invested in small and medium-sized firms rather than in big enterprises results from the more effective utilisation of the capital in those firms. In the event of small firms, an effect of regional decentralisation takes place. It consists in the local nature of firms which are flexible while selecting a location and at the same time contain the migration of people in the productive age from villages and small towns to large city agglomerations.

The major barriers to the development of small and medium-sized wood-processing enterprises include:

- Insufficient own financial resources. As a result of low profitability of most of the sectors of the wood-processing industry, their financing with own capital is very difficult. In the opinion of many enterprises, cost of a bank credit is too high in relation to the reached profitability.
- Cost of purchase of timber raw material. This is of special significance in the saw milling sector where it reaches the level of 50-55% of total costs. In the past two years, the rate of growth of sawnwood and sawn semi-products was lower than the rate of growth of average timber prices.

- Low internal demand (on the home market) caused to a great extent by low income level of the population, slump in the housing sector, substitution of wooden products, or lack of efficient promotion of wooden products.
- Low level of the applied production technologies resulting from financial weakness, as well as by the specifics of some sectors.
- Legal regulations making it impossible to recover receivables.
- Lack of sufficient management and marketing knowledge.
- Lack of sufficient knowledge of company management/business administration.
- Lack of sufficient knowledge of technologies useful for company development.
- Lack of ideas about new products.

Annex C: Organisations studying wood processing industries and main publications and information sources.

- Central Statistical Office (GUS)
- Ministry of Economy and Labour
- Institute of Wood Technology
- Agricultural University in Poznan, Faculty of Wood Technology
- The Polish Economic Chamber of Wood Industry
- The Forest Research Institute

Publications:

Bałtowski M. 2002: Przekształcenia własnościowe przedsiębiorstw w Polsce. PWN, Warszawa.

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Gałecka A., Ratajczak E. 2000: Miejsce sektora małych i średnich przedsiębiorstw w przemyśle drzewnym i meblarskim. Przemysł Drzewny 5 s. 1-4

Informacja o udziale inwestorów zagranicznych w procesie prywatyzacji polskiej gospodarki w latach 1990 – 2002. Raport Ministerstwa Skarbu Państwa, Warszawa

Kocel J. 1995: Bariery rozwoju prywatnej przedsiębiorczości w leśnictwie. Sylwan R.139 nr 4 s. 79-86

Kocel J. 2000: Wpływ prywatyzacji działalności gospodarczej nadleśnictw na przemiany ekonomiczno-organizacyjne w gospodarce leśnej Polski w latach 1989-1996.

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Lis W. 2003: External factors restrictive the crisis in Polish enterprises of wood industry. Referat i prezentacja na „Międzynarodowej konferencji naukowej pt.: Materials economy management in wood industry enterprise in perspective of

integration with European Union - ECONOMIC FORUM ‘2003”. Laski k. Kępna, 16 - 18.09.2003, s. 7

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Lis W., Tabert M., Popyk W. 2001: System ekonomicznych i technologicznych warunków wspierania rozwoju małych i średnich przedsiębiorstw przemysłu drzewnego w Polsce na tle wymagań Unii Europejskiej. AR Poznań

Lis W., Popyk W. 2001: Niektóre aspekty funkcjonowania małych i średnich przedsiębiorstw przemysłu drzewnego w Polsce. Wood&Paper Revier 1

Lis W., Tabert M. 2002: The outer support of small and medium companies of the wood industry. „Intercathedra” - Annual Bulletin of Plant - Economic Departments of the European Wood Technology University Studies, No 18, s. 37 – 44

Lis W., Popyk W. 2003: Efektywność eksportu w polskich przedsiębiorstwach meblarskich. „Intercathedra” - Annual Bulletin of Plant - Economic Departments of the European Wood Technology University Studies, No 19, s. 77 – 82

Lis W. 2004: Czynniki zewnętrzne ograniczające kryzys w polskich przedsiębiorstwach przemysłu drzewnego. External factors restrictive the crisis in Polish enterprises of wood industry. Referat i prezentacja na „Międzynarodowej Konferencji Naukowej pt.: Zarządzanie kryzysowe przedsiębiorstwem przemysłu drzewnego w warunkach integracji z Unią Europejską – Materials economy management in wood industry enterprise in perspective of integration with European Union - ECONOMIC FORUM ‘2004”. Laski k. Kępna, 16 - 18.09.2004, s. 7.

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Lis W. 2004: Processes of privatisation in Polish wood industry. W monografii pt.: “The growth and development in forestry and wood industry. Chapter 2. Management”. International Association for Technology – Management - Wood. University of Zagreb, Faculty of Forestry. Zagreb, Croatia, Scientific book, s. 59 – 66.

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Prywatyzacja działalności gospodarczej Nadleśnictw. Wytyczne ramowe Dyrekcji Generalnej Lasów Państwowych, Warszawa 1995

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Prywatyzacja przedsiębiorstw państwowych. Roczniki 1992-2003. GUS, Warszawa.

Ratajczak E. (*2001*): Polski przemysł meblarski nadal konkurencyjny. Przemysł Drzewny 6, s. 3-6

Ratajczak E., Szostak A. 2001: Integracja z Unią Europejską – ważniejsze problemy adaptacyjne w przemysłach przerobu drewna. Przemysł drzewny 5 s. 3-8

Rocznik Statystyczny Handlu Zagranicznego 1995-2003. GUS, Warszawa

Stasiuk T., Frączyk J. 1999: Przemysł płyt wiórowych i sklejek. Boss-Gospodarka, 6

Strategia dla przemysłu drzewnego do 2006 roku. Ministerstwa Gospodarki, Pracy i Polityki Społecznej, Warszawa 2003

Szczawińska E. 2003: Możliwości rozwoju małych i średnich przedsiębiorstw przemysłu drzewnego w Polsce [Development potential of small- and medium-size firms in the wood industry sector in Poland]. Conference materials „Leśna przedsiębiorczość", Sękocin 2003

Szkutnicka – Pieniążek M. 2002: Polska 2002. Raport o stanie gospodarki. Ministerstwo Gospodarki Warszawa

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Zając S. 1999: Analiza rynku surowca tartacznego i tarcicy w Europie w 1998 roku. Przemysł Drzewny nr 2 s. 1-6.

See also **Part 1**.

4. Non-wood forest products and services

4.1. State of the art and historical development

Historical development of non-wood production and services in the country

Utilisation of non-wood forest products has its particularly rich tradition as a branch of forestry in Poland. The so called **Polish concept of forest minor production**, being the effect of work and experience of generations of foresters, was developed in the 40's of the 20th century under the supervision of professor Wiesław Grochowski. The concept's basic assumption has been the idea according to which the whole of forestry production process: both the production of wood and the production of all other forest uses (non-wood forest products – NWFPs), are oneness. The year 1989 was crucial for the use of NWFPs. The harvesting and processing of goods was taken over by private sector.

In the after World War II period, the leading branch of forest utilisation was - till the end of the 70-s, collection of Scots **pine resin** *(Pinus sylvestris L.)*. Beginning with the early 80-s however, a process of continuous decrease and finally complete cessation of resin harvest has been observed. Nowadays, our domestic production of resin was totally supplanted by the imported raw material, first of all from Belarus, the Ukraine, China and Brazil. The raw material resources, estimated in the after war period for some 30 thousand tons a year, are currently assessed to be approximately 24 thousand tons a year.

Spruce **bark** was commonly used in Poland in the tanning industry in the fifties and sixties (reaching the maximum level of more than 16 thousand tons in the year 1952). Later, however, its utilisation has been decreased as a result of the import of high quality tannin raw materials and the common use of synthetic tanning agents. Large amounts of pine bark are used in horticulture. No data are available on the actual size and use value of bark utilised this way. Still important forest raw is the bark of buckthorn *(Frangula alnus)* and oak *(Quercus sp.)* harvested for the needs of the

pharmaceutical industry (with demand exceeding largely the supply), these are however merely hundreds of tons.

Under the Poland's condition, the only rational direction of utilisation of **forest trees needles** is the production of volatile oils: the pine oil and, though to a lesser extent, the fir oil.

The problems connected with utilisation of **forest floor goods** are currently becoming especially important in Poland. The Polish concept of minor forest production assumed that the harvest of forest floor economic plants and mushrooms be organised or, at least, supervised by the administration of the State Forests. This idea had found its practical expression in the large network of purchase spots, those were run following the close co-operation with local foresters. On the other hand, the gathering of plants and mushrooms for the collectors' own use and other than protected species and carried outside the protected areas was unlimited and, actually, out of control.

Table 21. Selected non-wood forest products harvested in Poland (1950 – 2000) in tons.

Year	**1950**	**1960**	**1970**	**1980**	**1990**	**1992**	**1994**	**1996**	**1998**	**2000**
Resin	11686	22728	19821	9265	6400	806	0	0	0	0
Forest fruits	10300[1]	36800[1]	4500[1]	2824	3006	1258	252	5683	n.a.	10127
Edible mushrooms	1700[1]	2371	4546	6078	2792	618	87	940	n.a.	1705
Tannin spruce bark	11200	7100	1300	0	0	0	0	0	0	0

Note: 1: approximate data

Among **non-wood forest services**, the greatest emphasis in Poland is being drawn to the utilisation of recreational function of forests. A broad adjustment of forests for recreation was started at the early seventies of the 20th century. A dense network of facilities serving recreation and tourist needs was then constructed such as camping site, forest bivouacs, parking areas. The construction and maintenance costs of these facilities were covered by the State Forests. Nowadays, recreation and tourism are a permanent and constantly growing social phenomenon. The urbanisation and industrialisation processes and a resultant rise in population of the cities have caused that the demand for recreation, whose natural form is a regular contact with natural environment, is increasing. Forests being a great attraction are at the same time one of the least expensive forms of recreation. Forests are broadly accessible to the public and the access is free of charge. A tourist pressure on forests increases particularly around large industrial centres and urbane agglomerations. From the research by Głuch i Łonkiewicz (1991), it appears that nearly 50% out of 300 thousand respondents declare forests as the most attractive form of recreation. The growing general concern of society for recreation with special regard to forest areas point to the need of making forest areas accessible for recreation.

NWFP&S definition, classification and relevance in rural economies

The non-wood forest products in Poland used to be understood as:

- goods of plant origin – resins, gums, bark, foliage, forest fruits, medicinal herbs, industrial plants, moss, etc.,
- edible mushrooms,
- goods of animal origin – animals, skins or other hunting products, snails, the products of forest bee keeping and silk-worms etc.,
- dug products (regardless their origin) – peat, sand and others.

The wildlife management traditionally being a separate branch of forestry does not participate in minor forest utilisation in spite of the management of plantations of economic plants (basket willow, Christmas trees, medicinal and fruit-bearing plants) and charcoal burning.

In the multifunctional forestry the concept of forest minor production gains ever greater importance. The broadly understood benefits (often non-measurable ones) derived from forests are linked with the protective, landscape and recreational functions of forests.

Table 22. Selected non-wood forest products harvested in Poland and their actual relevance

Product	**Status**	**Economic relevance for rural economies**
fruits	heavily harvested, available data are not complete (considerable extent of harvest volume is unrecorded)	high
mushrooms	as above	
herbs	heavily harvested; mainly outside forest sector – increasing importance of plantations;	poorly recognised
parts of plants for ornamental purposes (i.e. mosses)	locally heavily harvested – harvest volume difficult to be estimated	considerable share of harvest is unrecorded.
resin	cessation of harvest in 1993	
bark	waste: utilised outside forestry sector, for horticulture; tanning: cessation of harvest in 1975; pharmaceutical: utilised – several species.	poorly recognised
forest grazing	historical importance	
forest fodder	historical importance	
forest litter	historical importance	

In the 60-s and 70-s, minor forest utilisation in the State Forests had participated in up to 25% to the total value of forestry production. At present, the actual value of minor forest production is estimated at 2%. The most substantial problem is the fact that the importance of minor forestry production has been nowadays underestimated by the forestry administration.

Property rights regulation system (access)

The access to the State-owned forests that dominate in Poland is free of charge. Forests are made accessible for the collection of forest fruits from herbaceous cover for people's own needs without restrictions. The forest administration may refuse to enter a forest in cases where the collection of forest fruits threatens the forest environment. The collection of fruits for commercial or industrial goals requires to enter into a contract with a forest district.

List of statistical information sources, databases, web sites at national/local/enterprise level, review articles.

Web-pages and institutions

Name	**Information**	**www**
Ministry of the Enviroment (*Ministerstwo Środowiska*)	Legislation, Policy	http://www.mos.gov.pl/
National Forest Holding "The State Forests".	Administration.	http://www.lp.gov.pl/
Central Statistical Office in Warsaw (*Główny Urząd Statystyczny*)	Data about production and value of NWFP&S	http://www.stat.gov.pl/
Agricultural University of Cracov. Faculty of Forestry. (*Akademia Rolnicza w Krakowie im. Hugona Kołłątaja*)	Education, Research.	http://www.ar.krakow.pl
The August Cieszkowski Agricultural University of Poznań (*Akademia Rolnicza im. Augusta Cieszkowskiego w Poznaniu*)	Education, Research	http://www.au.poznan.pl
Warsaw Agricultural University. Faculty of Forestry.	Education, Research	http://www.sggw.waw.pl/
Forest Research Institute in Warsaw (*Instytut Badawczy Leśnictwa w Warszawie*)	Research	http://www.ibles.waw.pl/

Articles

Author	**Title**	**NWFP&S**	**Information**
Janeczko E., 2000	Próba oceny krajobrazu leśnego na przykładzie lasów Mazowieckiego Parku Krajobrazowego (w:) Mat. z III forum architektury krajobrazu, OOZK, Warszawa	Recreation	Case study – landscape assessment
Janeczko E., 2002	Środowiskowe i społeczne uwarunkowania funkcji rekreacyjnej lasów Mazowieckiego Parku Krajobrazowego (MPK), praca doktorska, SGGW, Warszawa	Recreation	Case study – social functions of forests
Janeczko K. i in., 2002	Ekonomiczne konsekwencje realizacji pozagospodarczych funkcji lasów na przykładzie wybranego leśnego kompleksu promocyjnego. Praca wykonana na zlecenie Dyrekcji Generalnej LP, Warszawa	Recreation	Case study – value assessment of non-productive functions of forests

Kalinowski M. 1998	Non-Wood Forest Products in Poland. EFI Proceedings. 23.	NWFP in general	State of the art
Kalinowski M. 2000	Wybrane aspekty użytkowania jadalnych owoców leśnych W: "Stan i perspektywy badań z zakresu użytkowania lasu". Materiały III Konferencji Leśnej. Sękocin Las, 30-31 marca 2001 r. IBL. Warszawa.	NWFP in general	State of the art
Kalinowski M., Rzadkowski S. 2001	Harvesting of non-wood forest products in Poland and their resources. Seminar Proceedings. Menemen-Izmir, Turkey 2-8 October 2000. FAO. Roma.	NWFP in general	Harvesting and resources
Łonkiewicz B., Gołąb P., Gozdalik M., 1982	Analiza zapotrzebowania społecznego na funkcje rekreacyjne lasów jako podstawa ich racjonalnego zagospodarowania turystycznego, Dok. IBL, Warszawa	Recreation	Social demand, recreational management
Staniszewski P., 1998	Użytkowanie zasobów runa leśnego w trwałej i zrównoważonej gospodarce leśnej. Sylwan 8: 81-88, Sum.	Mushrooms, fruits, berries, herbs	Utilisation of forest ground cover resource at sustainable forest management
Staniszewski P., Oktaba J., 2000.	Current Trends of Changes in the Utilisation of Non-Wood Foorest Goods and Benefits in Poland. Harvesting of Non-Wood Forest Products. Menemen-Izmir. Proceedings.	NWFP in general	State of the art, trends, rules, policy
Staniszewski P., 2001.	Aktualne problemy użytkowania leśnych surowców niedrzewnych w Europie. Sylwan 7: 79 – 87, Sum.	NWFP in general	State of the art, trends, rules, policy – in Europe
Staniszewski P., Głowacki S., 2002.	Próba oceny możliwości reaktywowania żywicowania sosny zwyczajnej (Pinus sylvestris L.) w Polsce. Użytkowanie lasu w wielofunkcyjnym, zrównoważonym leśnictwie. Wyd. SGGW, Warszawa. s. 102 – 107, Sum.	Resin	Assesment of the reactivation possibility of resin harvesting in Poland

Literature:

Central Statitical Office, 2003: Information and Statistical Papers "Forestry 2003". Warszawa.

Grochowski W. 1990: Uboczna produkcja leśna. PWN. Warszawa.

National and local organisations studying non-wood forest products and services and their special field of work.

- Forest Research Institute, Warsaw
- Warsaw Agricultural University, Faculty of Forestry, Department of Forest Utilisation
- Agricultural University of Cracow, Faculty of Forestry, Department of Forest and Wood Utilisation

- August Cieszkowski Agricultural University of Poznan, Faculty of Forestry, Department of Forest Utilisation

The main directions of research study connected with the utilisation of non-wood forest products in Poland are:

- survey of NWFPs resource bases in order to enable the rationalization of the resource utilisation;
- study on quality of forest raw materials with particular attention paid to the impacts of a number of factors (both biotic and abiotic factors, with particular emphasis on the anthropogenic influences);
- study on the effect of NWFPs utilisation on the natural environment;
- the role of cultivation practices and plantations in the minor forest production;
- assessing the potential for and economic efficiency of the NWFPs utilisation;
- assessment of the possibility to reactivate resin harvest in Poland;
- development and verification of the principles of NWFP&Ss utilisation in the sustainable forestry.

The broadly understood utilisation of non-wood forest functions especially recreational function of a forest is a separate and relatively novel issue. The aim of actions that are being taken in this area is a comprehensive analysis of the usefulness of a forest for recreation deriving from the natural capacity, recreational accessibility and scenic beauty of a forest.

Policy framework and regulations

A document of the paramount significance for sustainable and balanced forest management is National Policy on Forests adopted in 1997. The overriding aim of policy concerning forests is to designate the complex of actions shaping relations between humankind and forests, with the aim of preserving, in changing natural and socio-economic circumstances, the conditions for the indefinite maintenance of forests, their universal utility and protection and their role in the shaping of the natural environment, in line with the present and future expectations of society. One of the goals of the National Policy on Forests is regulation and steering of recreation and tourism in forest areas in a manner harmonising the social functions of forests with the protective and productive functions.

The main legal basis for managing forests is the Forest Act of 28 September 1991 (Dz. U. 91.101.444 of 8 November 1991). The Act defines the principles for the maintenance, protection and enlargement of forest resources and the rules for the forest economy as linked with other elements of the environment and the national economy. It also defines the principles of **sustainable forest management** and determines its aims such as the production – on the basis of a rational management - of wood and non-wood forest products.

Pursuant the Act the forest owners are obliged to maintain the permanency of forests and ensure the continuity of their use among others to harvest wood and non-wood forest products in a manner that the biological capabilities of forests are retained, as well as to protect forest floor vegetation.

In accordance with the provisions of the Forest Act, the State Forests are obliged to initiate, co-ordinate and carry out periodical evaluation of the state of forests and forest resources, as well as to anticipate changes ongoing in forest ecosystems; to carry out periodical large-scale inventories of the forest state and to update databanks about forest resources and the state of forests. Forests that are the property of the State Treasury are made accessible for the collection of forest fruits from herbaceous cover for people's own needs without restrictions. The forest administration may refuse to enter a forest in cases where the collection of forest fruits threatens the forest environment. The collection of fruits for commercial or industrial purposes requires entering into a contract with a forest district.

Other legal acts relevant from the point of view of the NWFP&S utilisation are:

- Act of 4 July 2004 on nature conservation (Dz. U. 2004 No. 92, item 880) and the regulation of the Ministry of the Environment of 11 September 2001 on drawing up the list of wild indigenous plant species subject to full and partial protection, restrictions specific to them, as well as waivers (Dz. U. No. 106, item 1176 of 29 September 2001).
- Regulation of the Minister of Environment, Natural Resources and Forestry of 28 December 1998 on detailed principles for the protection and collection of fruits of herbaceous forest cover and principles for the location of apiaries in forest areas (Dz. U. 1999 No. 6, item 42).
- Regulation of the Minister of Health of 19 December 2002 on mushrooms permitted for sale or processing, as well as on mushroom classificator and expert licence (Dz. U. of 2003 No 21,item 178). The regulation contains, among others, the list of edible mushrooms permitted for sale and processing (42 species).
- The Hunting Law Act of 13 October 1995. (Dz. U. 95.147.713 of 18 December 1995), drawing up the principles for wildlife population management.

4.2. Case studies of successful marketing strategies

Case study 1: Forest fruits and mushrooms

(a) NWFP&S definition, area of production, harvesting level, technical characteristics of production

The "case study" is a review of websites of 24 firms operating in the sector of purchase, processing and sale of non-wood forest products.

A group of 25 companies involved are the producers of: forest mushrooms (fresh, frozen, dried, pickled, in natural marinade, sterilised, blanched, in oil, decorative mushrooms, mushroom concentrate, granulate – fig. 1) a forest fruits (fresh, frozen, for meat, marmalade, deserts, dried). Nearly 70% of firms in the group surveyed are dealing both with fruits and mushrooms, little above 30% - exclusively with mushrooms. The assortment of mushrooms is considerably richer (15 species) when compared with fruits, which represent only three species: bilberry, cowberry and cranberry. It is noteworthy that only a small number of mushroom species is intensively harvested.

Figure 2. Mushrooms: dried, pickled and frozen (Source: Jampol)

The websites of firms reviewed do not provide information about the harvest and production volume. Only general information can be found for example forest and cultivated fruits. Currently, the Central Statistical Office is the only source of data available at a country level (see Table 23).

Table 23. Volume and other selected characteristics of industrial harvest (purchase) of forest floor goods (table prepared according to data of the Central Statistical Office 2003)

fruits				**mushrooms**			
1999	**2000**	**2001**	**2002**	**1999**	**2000**	**2001**	**2002**
purchase volume (tons)							
11280	10127	8745	15062	1484	1705	3276	2379
purchase value (thousands of PLN and EUR)*							
45,615.5	54,105.9	23,767.1	39,384.8	19,404.2	17,649.0	29,161.1	28,242.7
10,372.6	13,540.0	6,123.9	9,657.4	4,412.4	4,416.7	7,513.8	6,925.3
share of main species in the purchase volume (%)							
bilberry				chanterelle, king bolete, bay bolete			
n.a.	n.a.	62	57	n.a.	n.a.	98	94

*) conversion of Polish zloty to the euro is estimated according to National Bank of Poland mid - rates in the years 1999-2002:

According to the Central Statistical Office data of 2001 and 2002, the export of mushrooms amounted to 8,999 and 6,731 tons, respectively. Taking into consideration the minimal export level and in the light of information about the purchase volume (Table 3) this means a considerable surplus of export over harvest. This may result from a high percentage of unrecorded purchases, as well as stating in the records forest and cultivated mushrooms jointly.

In 2002, exports of forest fruits amounted to 2,454 tons, and imports – to 3,438 tons, which, at the harvest level of 15,062 tons, provides 16,046 tons for the domestic market.

75% of firms in the group under study have declared exports to the following target countries (in parenthesis – the number of firms): Germany (4), Italy (2), Switzerland (2), France (2), Spain (1), Great Britain (1), Austria (1), USA (1), Canada (1), Israel (1), Argentina (1), Sweden (1) and Denmark (1). One firm acts as an agent importing mushrooms from Russia and Belarus and exporting them to the West European countries (after radiological examination).

Several firms can boast modern processing and packaging lines (Fig. 2) or liquid nitrogen-based cryogenic tunnels for deep freezing of fruits and mushrooms thus minimising the loss of their value. In this way the final product, offered in shops is almost the same quality as fresh mushrooms straight from the forest.

Figure 3. Mushroom processing line (Source: P.H.U Danex)

(b) Description of the "product chain" organisation.
(c) Policy framework – see above separate heading: "Policy framework and regulations"
(d) Profit appropriation by the landowner/contractor/manufacturer/dealer/seller
(e) Contractual agreements between non-wood processing

The product chain in the version typical for the group of firms surveyed is as follows:

forest → collectors → buying spots → processing → middlemen → consumers

The forest administration (in a majority of cases the State Forests) does not actively participate in the chain. Regardless of the regulations in force neither the collector nor the purchase spots enter into a contract with the owner of a forest. The form of co-operation between the firms and the buyers of forest products is imprecise. This probably takes place on the basis of a certain form of co-operation or contracting. The number of purchase spots per firm and geographical distribution of the network of purchase spots are unknown. The firms deliver raw material or products to the receivers by their own means of transport or those of the co-operating enterprises. A number of

firms have admitted that catering firms are their end receivers. Four firms (17%) have declared deliveries to hypermarkets.

A considerable part of the forest mushrooms and fruits market is of the primitive nature and not included in any statistics – the collectors sell fresh fruits or mushrooms along the roads or on local markets. In this way the product chain is markedly shortened:

forest → collectors → consumers

The number of firms operating on the market is unknown. A catalogue of 25 firms has been found in the Internet resources. 63% of firms in the group under study are one-person firms (including 40% belong to women and 60% - to men). The forms specified are: enterprise, limited liability company, general partnership, partnership.

Profit appropriation by landowner/contractor/manufacturer/dealer/seller is not known, but in accordance with general observation of Lintu (1998), the position of the gatherers, primary processors and middlemen compared to the more committed members of the marketing and processing chain is weak.

(f) Characteristics of technological or organisational innovation behaviour in non-wood production, processing and service industries

The important technological innovation behaviour observed in the surveyed group is deep-freezing, which allows keeping high quality of mushrooms and berries for the long time

(g) "Territorial" marketing (i.e.: the integration of the NWFP&S to other services and products offered by the local community)

- use the same production lines or technological equipment for other, especially agricultural products (cultivated mushrooms, fruits, vegetables)
- other side-line activity

62% of firms in the group under study have declared to run a "non-forest" activity. The firms concentrate first of all on production, purchase, processing and sale of cultivated mushrooms (oyster mushroom, common mushroom, shii-take and mun mushrooms) and substrates to cultivation, fruits and vegetables. The specific kinds of side-line activity are: the production of quail pickled eggs, powder ice-cream concentrates and waffles. A number of firms have processing lines for frozen food production

(h) Lessons learns/driving forces/factors affecting competitiveness (SWOT analysis)
(i) Open questions (barriers to entrepreneurship) and related research needs

- variation of resource (and supply) in space and time, including seasonality (feature of some species described by Saastamoinen 1998 and Lintu 1998)
- weakness of the gatherers, primary processors and middlemen, comparing with the further of the chain members and other products/substitutes (feature of NWFPs chain described by Lintu 1998)
- evolution of NWFPs markets - loss of traditional markets because of competition with synthetic materials, emerging new markets (described by Lintu 1998)

STRENGHTS (S)	WEAKNESSES (W)
- new, flexible and modern sector based on SMEs - innovations (deep-freezing)	- lack of producers organisation and representation (associations etc.) - variation of resource (and supply) in space and time, including seasonality (feature of some species described by Saastamoinen 1998 and Lintu 1998) - low durability of mushrooms and fruits as a fresh products (Grochowski 1990) - weakness of the gatherers, primary processors and middlemen, comparing with the further of the chain members and other products/substitutes (feature of NWFPs chain described by Lintu 1998) - poor knowledge and low implementation level of existing regulations – consumption of only few highly valuable fruits and mushrooms (above all: bilberry, chantarelle and edible boletus).
OPPORTUNITIES (O)	THREATS (T)
- picking, consuming of mushrooms and berries deeply rooted in country tradition - the considerable part of the named by Lintu (1998) “green” and “nostalgia” market - continuous growth of demand	- replacing some species by cultivated equivalents, for example the most important forest fruit - bilberry (Vaccinium myrtilus L.), by very similar highbush blueberry – (Vaccinium corymbosum L.)

(j) Recommendations, proposals for documentation.

Very important is to focus on NWFP&S economic, marketing and social aspects, with emphasise on:

- special features of resource and product
- evaluation of cities population demand for NWFP&S (very little known, crucial for the Action)
- contribution of NWFP&S to rural development and role of SMEs in the process

The surveyed firms:

Internet portal „Onet.pl” 2004. The catalogue of enterprises by branches. Agriculture, silviculture, food. Mushrooms, forest floor. http://katalog.onet.pl/191,kategoria.html

Name	Web site
Biegpol	http://www.biegpol.pl
A.H. "Boletus"	http://www.boletus.home.pl
P.P.H.U. Bruspol	http://www.bruspol.pl
P.H.U. Danex	http://www.danex.pl
P.H. EWiTA	http://republika.pl/ewitaewa
Food S.C.	http://www.nawrot.zgora.pl
Wiesław Guzik	http://www.grzyby.krakow.pl
Jampol	http://www.jampol.pl
Kasol	http://www.kasol.com.pl/
PPUH Komirex	http://www.komirex.com.pl
„Las-Bór"	http://www.las-bor.cil.pl
Las Olsztyn Sp. z o.o.	http://www.las.com.pl
„Lasovia"	http://www.lasovia.pl
Lobo export-import	http://www.lobo-ariti.com
Morzycki	http://www.morzycki.pl
PHU Noris II	http://www.noris.com.pl
PolGrzyb	http://www.polgrzyb.pl
Polwit P.H.	http://www.tai.com.pl/firmy/pn/polwit
PROVITUS	http://www.provitus.com.pl
P.P.H.U, „Runo Leśne"	http://republika.pl/runolesne
Runopol	http://republika.pl/runopol
Zakład Produkcji Spożywczej – Stefan Skwierawski	http://www.skwierawski.com.pl
Tagros-Polska	http://www.tagros.pl
OOO „Verpol"*	http://www.verpol.ru
Żynda	http://republika.pl/grzybyzynda

* The polish company with the head office in Russia

Literature:

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Case study 2: Recreation in forests

The best illustration in terms of utilisation of recreational functions of forests is the research on the assessment of conditions for the development of recreational functions of forests of the Mazowiecki Landscape Park (MPK) (Janeczko 2002). Evaluation studies on scenic beauty of forests that are carried out in Poland are occassional. However the need to launch such studies is emphasised by many researchers (for

example Stanowska, Stanowski 1984, Janeczko 2000, Stępień et al. 2000). It is by no means a new trend in the recreational management of Polish forests. It has to be thought that the fast development of research methods and studies on scenic values of forests proceed along with the growing demand for forest social functions. Currently, a spatial approach to forest natural environment is being emphasised in a majority of analyses. This is a result of the advancement and, first of all, wide availability of modern techniques of space management. Digital databases that most forest districts in Poland have at their disposal contain detailed information about forests. Studies on recreational needs and preferences of tourists play a particular role in recreational management of forests. In Poland studies in this area have been conducted for over twenty years (Łonkiewicz et al. 1982; Krauz 1989; Gołos 2002; Janeczko 2002). They allowed to establish preferences of tourists as regards forms and sites for recreation, recreational management of forest, time and frequency of recreational activities, as well as preferable elements of the scenic beauty of forests.

A broader approach to the issue of social preferences has been presented in the studies concerning the assessment of the conditions for the development of recreational functions of forests of the Mazowiecki Landscape Park (Janeczko 2002). These studies permitted to determine not only recreational preferences of a tourist, but also to establish relationships between such preferences and individual characteristics (sex, age, education) family status and place of residence. So far, no studies has taken account of recreational needs of handicapped persons. Only recently, have been undertaken studies aimed at defining principles concerning access to forests for the needs of the handicapped persons especially those using wheelchairs (Woźnicka 2002, 2003). Such studies are presently carried out in the communal forests of Warsaw.

The development of studies on the assessment of the non-wood forest services may cause that in the future these services will subject these services to the market economy rules. Today, the costs of recreational management of forests are mainly covered by the State Forests while benefits go to the business entities providing tourist services. Studies on the estimation of profits obtained by the beneficiaries of non-wood forest functions were carried out in the "Białowieża Forest" Promotional Forest Complex (Janeczko et al. 2002). The result of the study was a detailed characterisation of the composition of expenses incurred by tourists visiting the Forest Complex and at the same time the structure or the structure and estimate value of additional revenues generated by the beneficiaries of non-production forest functions.

Literature:

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Janeczko E., 2000: Próba oceny krajobrazu leśnego na przykładzie lasów Mazowieckiego Parku Krajobrazowego (w:) Mat. z III forum architektury krajobrazu, OOZK, Warszawa

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Krauz K., 1989: Społeczne odczucia walorów rekreacyjnych lasów (w:) Rekreacyjne użytkowanie lasów. Mat z I Sympozjum Naukowego zorganizowanego przez AWF Poznań oraz ZLP Piła, Morgolin 6-8 listopada 1989

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Stanowska L., Stanowski T., 1984: Przyrodnicze kryteria waloryzacji rekreacyjnej przydatności lasów górskich, Czasopismo Geograficzne, 4/84, 453-463

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Woźnicka M., 2003. Ocena dostępności leśnych ścieżek przyrodniczych dla rekreacji osób niepełnosprawnych na przykładzie lasów miejskich Warszawy. An estimation of forest nature paths acccessibility to handicapped people recreation, on example of Warsaw municipal forest. Kształtowanie i ochrona środowiska leśnego. Wydawnictwo AR w Poznaniu. 2003.

4.3. Conclusions: Supporting and limiting factors for enterprise development in non-wood forest products and services production and barriers to enterpreneurship

See case study 1: forest fruits and mushrooms, points h), i) and j).

5. Forests and ownership

5.1. State of the art and historical development

In the past, forests were present nearly all over Poland. The social-economic processes in which economic goals dominated as a result of agricultural expansion and increased demand for raw wood materials have had a great impact on the changes of Poland's forests. By the 18th century, the forest cover of Poland (in its then borders) had been 40% to drastically fall to 20.8% in 1945. Deforestations and associated impoverishment of species structure of stands have led to a decrease in biological diversity in forests and impoverishment of the landscape, as well as soil erosion and disturbance of the water balance in the country. Efforts to reverse the process began immediately after the World War II and continue till present. Today, the area of forest in Poland (as of 31.12.2001, according to data from the Central Statistical Office - GUS) is 8,942,000 hectares, which is equivalent to 28.6% of the country's forest area. In line with the standard adopted for international assessments, which takes account of the land associated with

forestry management, the area of forests in the country as of 1 January 1999 was 9,088,000 hectares. Poland's forest cover in accordance with the TBFRA 2000 standard (related to land area excluding inland waters) as of the end of 2003 was 30.0% and was close to the Central European average. The comparison of the forest area falling per 1 inhabitant (0.24 hectares) with the total land area is unfavourable for Poland and is one of the lowest in the region.

5.2. Forest resources

Areal structure of forest resources

Diversified conditions of forest distribution in Poland are illustrated in natural-forest regionalisation taking account of geological underlying material, climatic conditions, natural landscape types and forest shaping role of woody plant species. Poland's forests have mainly been retained on the poorest soils, as reflected in the differentiation into habitat types. The habitat structure of forests reveals a prevalence of coniferous forest habitat types with these accounting for 58.7% of the total forest areas, the more fertile broadleaved forest habitats account for 41.3%, and the alder carr and riparian habitats for 3.7%. Coniferous species prevail on 75.8% of forest area (Table 24). Within its Eurasiatic natural distribution range, pine (together with larch accounting for 67.6% of forests) has found the most favourable climatic and habitat conditions in Poland forming many valuable ecotypes (e.g. Tabor or Augustów pine). Preferential use of coniferous species by the wood-processing industry since the 19th century has contributed to the high share of conifers in stand composition. The years 1945–2003, brought major changes in the species structure of Polish forests expressed, among others, in an increased percentage of stands with a prevalence of broadleaved species from 13.0 to 23.2 in the State Forests. Nevertheless, their participation in the total share of forest area is still lower than the potential resulting from the spatial distribution of forest habitats.

Table 24. Areas of forests by type groups of trees

Specification	State Forests[1)]		National Parks[2)]		Private and commune-owned forests[3)]	
	'000 ha	%	'000 ha	%	'000 ha	%
Total	6986.9	100.0	180.0	100.0	1590.6	100.0
Coniferous trees	5366.0	76.8	107.4	59.7	1170.4	73.6
Pine and larch	4844.6	69.3	68.2	37.9	1008.9	63.4
Spruce	384.7	5.5	30.1	16.7	89.2	5.6
Fir and Douglas-fir	136.7	2.0	9.1	5.0	72.3	4.6
Broadleaved trees	1620.9	23.2	72.6	40.3	420.2	26.4
Oak, ash, maple, sycamore, elm	501.3	7.2	8.4	4.7	65.4	4.1
Beech	345.4	4.9	37.2	20.7	45.2	2.8
Hornbeam	20.1	0.3	1.0	0.5	17.2	1.1
Birch and robinia	409.9	6.0	11.1	6.2	131.7	8.3
Alder	304.0	4.3	13.4	7.4	143.1	9.0
Aspen, linden, willow	16.7	0.2	1.5	0.8	15.7	1.0
Poplar	23.5	0.3			1.9	0.1

Sources: BULiGL. Results of updating the state of forest area and timber resources in the State Forests as of 1.01.2003,
BULiGL. Assessment of the state of forest area and wood resources in the forest not in Treasure ownership as of 1.01.1999,
Central Statistical Office: Forestry 1999, after Ryszard Sumiński "National Parks" No. 3/1999

Prevalent in terms of forest age structure are stand classes II and III, respectively accounting for 21.8% and 23.8% of area (Table 25). Stands over 100 years old account for 8.3% of the State Forests Holding and of some 13.3% of standing timber resources. The indicators of changes in the age structure of stands are: a steady increase in the area of stands aged 80 years and over, from ca 0,9 million hectares in 1945 to ca 1,6 million hectares in 2003 (without KO, KDO) and an increase in the mean age of stands to 59 years in 2003 in the State Forests, as compared with 40 years in privately-owned stands.

Table 25. Areas of forests by age class

Specification	**State Forests[1)]**		**Private and commune-owned forests[2)]**	
	thousand ha	%	thousand ha	%
Total	6986.9	100.0	1590.6	100.0
including:	6925.0	99.1	1510.6	95.0
Age class I (1-20 years)	800.3	11.5	282.7	17.8
Age class II (21-40 years)	1315.4	18.8	552.9	34.8
Age class III (41-60 years)	1636.2	23.4	402.2	25.3
Age class IV (61-80 years)	1358.0	19.4	174.1	10.9
Age class V (81-100 years)	918.6	13.1	71.2*	4.5*
Age class VI (101-120 years)	389.8	5.6		
Age class VII (121 years and over)	187.9	2.7		
KO, KDO, SP	318.8	4.6	27.5	1.7

1) State as of 1.01.2003

2) State as of 1.01.1999

* Sources: BULiGL. Results of updating the state of forest area and timber resources in the State Forests as of 1.01.2003, BULiGL. Assessment of the state of forest area and wood resources in the forest not in Treasure ownership as of 1.01.1999

Changes in the area of forest

The basis for all the reafforestation works ongoing in Poland is "The National Programme for the Augmentation of Forest Cover" (KPZL). The Programme anticipates the afforestation an increase in the proportion of the country cover to 30% by 2020 and 3% by 2050. It also specifies the ecological priorities and economic mechanisms and instruments for programme implementation. While planning afforestation priorities at a commune level 12 priority criteria (ecological criteria prevail defining hydrological, geomorphologic and sozological functions) have been adopted and justified and synthetic indicators detailed for communes to which preference is given.

The year 2003, saw the afforestation of 26,494 hectares of land, including the largest afforested areas were in the Warmińsko-Mazurskie Province amounting to 3,556 hectares, Zachodniopomorskie Province – 2,795 hectares and Mazowieckie Province – 2,674 hectares. Recent years have seen a considerable (almost two-fold) increase in the amounts of private land afforested. In 1999, the figure was 6,902 hectares, in 2000 - 10 149 hectares, in 2002 - 10,409 hectares and in 2003 – 17,180 hectares which accounts for more than 65% in comparison with the previous year.

In addition to land afforestation (related to ex-agricultural land and wasteland) forest plantations are being established on land where mature stands had been felled. The year 2003 saw reafforestation on 39,630,000 hectares, of which 4000 hectares were restocked naturally.

A continuous reduction of the youngest stands area (age class I) has been observed; this phenomenon may have an impact on the reduction of forest sustainability in the future. The reasons behind this trend should be seen in, among others, significant reduction of aforestation, limitation of commercial cutting in favor of pre-commercial thinning and reduction of clear cuts. A positive result of commercial cutting reduction is growth of the older stand area; however, if the mature growing stock waits too long for cutting, its value as a raw material is depreciated.

The volume structure of growing timber resources

Since 1967, when the first full inventory was carried out in the State Forests, the timber resources have been steadily increasing. As of 1.01.2003, the standing timber resources administered by the State Forests were estimated to reach 1522.9 million m^3 of gross merchantable timber (according to the annual timber resources updates carried out by the Office of Forest Management and Survey - BULiGL). As of 1.01.1999, the gross merchantable timber in private and commune-owned forests was 188.6 million m^3 (BULiGL). According to the updates of forest resources in the State Forest Holding and other forms of ownership as of 1.01.2003, the estimated overall volume of Poland's forest resources thus amounts to ca 1787 million m^3 of gross merchantable timber.

The greatest share (50%) in terms of age structure is taken by stands aged of 41–60 and 61–80 respectively accounting for 23.8% and 17.9% of the total forest area. Pine is a prevailing species accounting for as much as 70% of the total forest resources under the management of the State Forests. This figure for this species in private and commune-owned forests is 55% (Table 26).

With regard to the forest area (without land associated with forestry management), the mean stand resource in the forests managed by the State Forests Holding as of 1.01.2003 was 218m^3/ha while as of 1.01.1999 it was 119m^3/ha in private and commune-owned forests.

Forests are a renewable source of raw wood materials that may condition civilisational development without harming the environment. In recent years, the use made of wood has come close to the natural potential as set in accordance with the principles of forest sustainability and increasing forest resources. In 2003, some 28,737 million m^3 of net merchantable timber was harvested in Poland, including 27,135 million m^3 of net merchantable timber from the State Forests. Of the letter, 56% of the overall potential harvest was obtained via intermediate (tending) felling, as well as incidental and sanitation fellings resulting from the needs to remove damaging effects caused by catastrophic events (e.g. blowdowns in the Pisz Forests). Timber harvest under a clear-cutting system has been limited to the level of 6.3 million m^3 of gross merchantable timber, i.e. to 23% of the overall harvest.

Table 26. Gross merchantable timber resource by type groups of trees

Specification	State Forests[1)]		Private and commune-owned forests[2)]	
	M m^3	%	M m^3	%
Total	1522.9	100.0	188.6	100.0
Coniferous trees	1199.5	78.8	138.3	73.4
Pine and larch	1059.6	69.6	103.3	54.8
Spruce	103.4	6.8	17.3	9.2
Fir and Douglas-fir	36.5	2.4	17.7	9.4
Broadleaved trees	323.4	21.2	50.3	26.6
Oak, ash, maple, sycamore, elm	100.6	6.6	7.9	4.2
Beech	86.5	5.7	7.8	4.1
Hornbeam	4.5	0.3	2.2	1.1
Birch and robinia	66.3	4.4	13.4	7.1
Alder	59.5	3.9	16.9	9.0
Aspen, linden, willow	3.7	0.2	1.8	1.0
Poplar	2.3	0.1	0.3	0.1

1) State as of 1.01.2003
2) State as of 1.01.1999
Sources: BULiGL. Results of updating the state of forest area and timber resources in the State Forests as of 1.01.2003,
BULiGL. Assessment of the state of forest area and wood resources in the forest not in Treasure ownership as of 1.01.1999

The standards adopted internationally in assessment of stand volume differ from the Polish definitions. To make the data more uniform, the forest resources specified in national statistics (in m^3 of gross merchantable timber) were supplemented by the volume of small timber (ca 20% of the overall gross merchantable timber resources). In accordance with the TBFRA 2000 assessment, Poland being a country with markedly great absolute forest area and higher mean stand resource (213 m^3/ha including small timber) has at its disposal the region's third (after Germany and France) largest volume of standing timber (gross merchantable timber and small timber) amounting to 1908 million m^3.

Changes in timber resources

In the period from January 1983 to January 203, the increment in gross merchantable timber in the forests managed by the State Forests was ca 903 million m^3. As ca 514 million m^3 of gross merchantable timber were harvested in the same period this means that 389 million m^3 of gross merchantable timber, or ca 43% of the entire increment was left to increase standing resources.

The mean annual increment in gross merchantable timber calculated for the past 20 years (1983–2002) from the difference at the end (January 2003) and beginning (January 1983) of the period including harvest and expressed per hectare of forest land managed by the State Forests was 6.58 m^3/ha. In turn, the mean annual increment in gross merchantable timber calculated in the State Forests over the past five years has been 7.73 m^3/ha. The volume of stands in all age classes has considerably increased; because of the marginal amount of merchantable timber in stands in age class I the volume is not considered significant component in the overall volume.

The changes in timber volume (volume per ha) in age classes suggest that an overall increase in the standing volume is not only the effect of increasing the area of forests. A steady rise in value of this indicator is being recorded for all age classes (except for KO/KDO). The observed rise in timber resources to some degree stems also from application of more precise inventory methods.

Non-wood forest products utilisation

As far as minor forest utilisation is concerned, the aspect of harvesting of non-wood forest products in Poland is, contrary to European countries, as important as utilisation of non-productive forest functions. In this respect, information on the raw material base for individual products is largely insufficient. The available data providing direct information on resources concern only the purchase of forest produce and not its real harvesting. Detailed examples and research issues related to this scope are described in the previous chapter.

5.3. Forest ownership

As far as the ownership structure of Poland's forests is concerned (Table 27), it is public ownership that predominates accounting for 82.5%, including the forests under the management of the State Forests National Forest Holding – 78.4%. The ownership structure of forests has not changed since the World War II. The observed rise in the share of total forest area that is within the national parks – from 1.0% in 1985 to 2.0% in 2003 (according to GUS, state as of 31.12.2003).

The comparison of the percentage share of public forests in the total forest area in the group of countries that have been selected for the purpose of the analysis points to a diversified ownership structure – the prevalence of public forest is found also in western countries (Switzerland, Germany). It is possible to identify three groups of the countries: those of the former USSR (CIS), in which 100% of forests are state-owned, the Nordic countries and France and Austria, in which a decisive majority of forests are in private hands, and remaining countries with a diversified structure however with a prevalence of public ownership.

The ownership structure of forests in Poland is spatially diversified with the greatest share of private forests being in the Małopolskie Province - 187,300 hectares (43.5% of the total forest area in the province), Mazowieckie Province – 330,700 hectares (42.2%) and Lubelskie Province – 217,300 hectares (38.7%). The lowest share of private forests are recorded in Lubuskie Province – 8,000 ha (1.2%), Zachodniopomorskie Province – 10,000 ha (1.3%) and Dolnośląskie Province – 13,200 ha (2.3%).

As far as private ownership in Poland is concerned, the decisive factor making it impossible to carry out effective forest management is huge (also on European scale) fragmentation of forest ownership. A different situation is in the public ownership sector. Here, the number of forest farms is among the lowest in the analysed group of countries.

The fragmented private forest structure, lack of full information on the volume of forest resources and timber harvest, as well as low business activity of forest owners require

radical solutions to enable proper evaluation of the condition of private forests and above all to create proper conditions for correct management and protection of forests.

Table 27. The ownership structure of forests in Poland

Specification	**1995 '000 ha**	**2000 '000 ha**	**2001 '000 ha**	**2002 '000 ha**	**2003 '000 ha**
Total	8756[a)]	8865[a)]	8894[a)]	8918[a)]	8942[a)]
Public forests	7262	7341	7349	7363	7379
State Treasury-owned forests	7186	7262	7270	7283	7298
Including: under the management of the State Forests	6868[b)]	6953[b)]	6968[b)]	6987[b)]	7006[b)]
National parks	162	181	181	181	181
Others	156	128	121	115	111
Commune-owned	76	79	79	80	81
Private forests	1494	1524	1545	1555	1563
Including: natural persons	1397	1428[c)]	1447[c)]	1458[c)]	1467[c)]
Land communities	68	69[c)]	68[c)]	68[c)]	67[c)]
Farm co-operatives	14	9[c)]	9[c)]	8[c)]	8[c)]
Others	15	18[c)]	21[c)]	21[c)]	21[c)]

a) Besides, land associated with forestry management: 1995 – 190,000 ha, 2000. – 194,000 ha, 2001 – 194,000 ha, 2002 – 195,000 ha, 2003 – 197,000 ha

b) Besides, land associated with forestry management: 1995 - 187,000 ha, 2000 – 189,000 ha, 2001 – 194,000 ha, 2002 – 190,000 ha, 2003 – 191,000 ha

c) Together with land associated with forestry management: 1999 r. – 400 ha in all private ownerships, 2000. – 200 ha, 2001 – 200 ha, 2002 – 300 ha, 2003 – 200 ha

5.4. Main problems and research questions in forest resources and ownership for enterprise development in forest sector

The following are selected major issues related both to forest research and practice in the above scope.

- Necessity to modify the way of assessing timber volume harvested through precommercial cutting (the tables do not reflect the reality).
- Modest database of the private sector, particularly with regard to the qualitative-dimensional and species structure of the harvested raw material.
- Lack of a tradition among private forest owners to form associations of communities.
- Necessity to revise the principles of determining the rotation age of individual species and sites taking into consideration the changing market conditions, as well as public demand for utilisation of non-productive forest functions and maintenance of biodiversity.
- Analysis of the techniques and technologies used by forest service providers for timber harvesting with regard to compliance with the sustained forest management rules.
- Creation of transparent principles of forest utilisation in the scope of harvesting of both wood and forest non-wood products as an executive document to be used in forest practice – (in the making).
- Emphasising the significance of the necessity to study the non-wood forest products base for their rational utilisation by local communities.