COST Action E30

Economic integration of urban consumers' demand and rural forestry production

Italy's country report

by

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Summary

Land ownership fragmentation, the lack in horizontal integration among the forest owners and the limited entrepreneurship of the forest managers are the main factors affecting the competitiveness of forest – wood / non-wood / services – consumer chain in Italy.

The barriers to entrepreneurship are connected with the limited profit arising from wood-related economic activities and the social profile of many land owners. The low profitability depends from the prevailing location of Italian forests: 95% of them are located in mountain areas, characterized by many environmental and infrastructural constraints. The low level of international timber prices in the last years and the de-localisation of many wood-working industries to foreign countries is reducing the internal demand for industrial roundowood from mountain areas. The social profile of many forest owners is characterised by the presence of many aged managers, working part-time in the sector, with a low attitude to introduce innovations, not much open to participate to associations and any other business activities carried out in cooperation with other economic operators.

The main problems and research questions for enterprise development in the forest sector are connected with the need to overcome the above-mentioned barriers; therefore, the problems seem more related to the need of a social change than to the lack of technologies.

Editorial responsabilities: Sections 1, 2, 4 and 5: D.Pettenella; Section 2: L.Venzi and F.Brun; Section 3: L.Cesaro and F.Carbone; Section 4 and the two NWFP&S case studies: S.Klöhn and L.Ciccarese. The authors are grateful to F. Grohmann for the review of the truffle case study.

1. Consumption

1.1. State of the art and historical development

In Italy all wood-related economic sectors operate in a highly disconnected forestry-wood system, whose main features seem to be:

- a fragmented and limited internal supply (equal to 8-9 cubic meters per year; 60% of fulewood), due to economic and environmental constraints; moreover, the internal supply is not distributed homogeneously. Most of the productive high forests (mainly coniferous) are in the northeastern regions (75% of the wood removals of conifer roundwood comes from this area) while coppices predominate in the centre of the country. The only relevant examples of forest plantations are the poplar stands in the northern plain areas of the river Po valley (70% of the total industrial roundwood comes from less than 100,000 ha of poplar cultivations in the Po valley). On the other hand, with the overall situation of wood productivity in Italy, poplar plantations probably represent financially the most productive investment in the forest sector in Europe;
- a consequent low self-sufficiency rate for wood supply (around 36% for semi-finished products); part of the reason for this, beside the economic and environmental constraints, is the fact that Italy's geographical position and international location is such that importing from neighbour markets (such as Austria, France, Switzerland, Slovenia and Croatia) is easier and faster than purchasing on local markets. For example, in the softwood market the commercial flow between Austria and Italy is, quantity-wise, exceeded only by that between Canada and the USA. Furthermore, due to the size of production, wood, furniture and pulp and paper industries need continuous, homogeneous and reliable timber provisions, which can only be guaranteed by foreign supply.

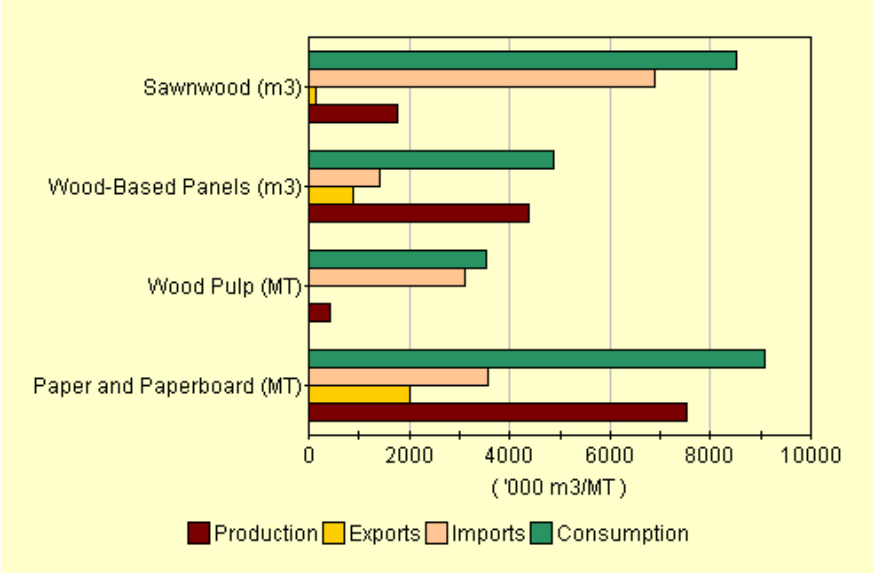
The lack of integration between domestic forest activities and the wood working industry is therefore one of the basic problem and at the same time one of the main challenge of the Italian forestry sector. The bulk of industrial activities is based on import of rough and semi-finished products, while internal supply is able only to cover small niches of the market (poplar logs used for plywood and mechanical pulp production, coniferous timber used in building activities in some mountainous areas, etc.).

1.2. Forest products' and services consumption

In figure 1 and in table 1 data on production, exports, imports and apparent consumption of semi-finisched products are reported. It is worthwhile to notice that Italy is a larger importer of semi-finished products, being a leading exporter of some finished products like furniture, window frames, special-use papers. Till 2002 Italy has been the larger world exporter in furniture, while currently it is the second after China. In the future, the process of de-locatisation will probably bring about a riduced internal demand (or a stabilisation of import) of semifinished products.

No data are available at national level on the consumption of services (see section 4 for some data on NWFP&S demand.

Figure 1 – Import, export, production and consumption of wood products in Italy



Source: FAO-ECE Timber Committee

Table 1 – Import, export, production and consumption of wood products in Italy

		Import		Export		Production	Consumption
	Units	Quantity	$US (x1000)	Quantity	$US (x1000)	Quantity	Quantity
Sawnwood	Cum	**7295000**	**2236123**	**174000**	**369115**	**1600000**	**8721000**
	Cum	5274000	1228104	49000	87088	700000	5925000
Sawnwood (NC)	Cum	2021000	1008019	125000	282027	900000	2796000
Wood-Based Panels	Cum	**1539000**	**784019**	**851000**	**521205**	**4020000**	**4708000**
Veneer Sheets	Cum	182000	269404	27000	105970	500000	655000
Plywood	Cum	378000	249221	139000	160386	420000	659000
Particle Board	Cum	642000	164425	202000	96238	2300000	2740000
Fibreboard	Cum	337000	100969	483000	158611	800000	654000
Wood Pulp	Mt	**3254000**	**1771812**	**14100**	**8133**	**462000**	**3701900**
Mechanical Wood Pulp	Mt	150000	78812	8000	4436	383000	525000
Semi-Chemical Wood Pulp	Mt	126000	54651	100	83	0	125900
Chemical Wood Pulp	Mt	2947000	1603119	6000	3614	79000	3020000
Dissolving Wood Pulp	Mt	31000	35230	0	0	0	31000
Paper+Paperboard	Mt	**3385000**	**3251534**	**2047000**	**2527064**	**8246000**	**9584000**
Newsprint	Mt	458000	328400	5000	5126	190000	643000
Printing+Writing Paper	Mt	1026000	1412332	908000	1070462	2780000	2898000
Other Paper+Paperboard	Mt	1901000	1510802	1134000	1451476	5276000	6043000
Roundwood	Cum	**5376000**	**702827**	**16000**	**10694**	**9550000**	**14910000**
Industrial Roundwood	Cum	**5143000**	**692017**	**14000**	**10462**	**4367000**	**9496000**
Sawlogs+Veneer Logs	Cum	0	0	0	0	2572000	2572000
Pulpwood+Particles	Cum	0	0	0	0	0	0
Other Indust Roundwd	Cum	0	0	0	0	1090000	1090000
Wood Fuel	Cum	**233000**	**10810**	**2000**	**232**	**5183000**	**5414000**
Wood Residues	Cum	**569000**	**21222**	**4000**	**706**	**600000**	**1165000**
Other Fibre Pulp	Mt	**27000**	**11371**	**1000**	**176**	**123000**	**149000**
Recovered Paper	Mt	**854000**	**106562**	**42000**	**5381**	**3300000**	**4112000**

Source: FAO-ECE Timber Committee

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

Italy is a country with a few number of large cities, while there is a large number of small- and medium size cities; it is not always easy to define the fringe between urban and rural areas. The presence of semi-rural urban areas is a common feature of the land-use system, especially in the recent industrialised regions.

There are no information available on the specific demand for forest related products and services by population living in large conurbations; however – as in other western European countries – it is possible to observe an increased demand for recreational and tourist services in rural areas. New more specific demands are connected with environmental education, specialised sport facilities (e.g.: mountain biking, horse riding), biodiversity.

An increasing attention has been paid by policy makers to the growing demand for new recreational areas and for landscape restoration in peri-urban zones. In the last two years, two Italian regions (Lombardia and Veneto) have approved laws to provide economic incentives - which are additional to those provided by the measures of the Rural Development Plans - for the creation of forests in plain areas, especially in peri-urban areas. On the basis of these initiatives, Lombardia region is going to create new large plain forests (Lassini, 2003). This programme of the so called "10 grandi foreste di pianura" [Ten big plain forests] derives from a direct commitment of the regional President and it has a strong political support: several workshops and an international congress have been organized to present the initiative, which is clearly aimed to rise political consensus among citizens living in the plain areas. In Veneto region, a new forested area of about 200 ha has been created near Mestre urban area, where air pollution due to the heavy traffic along the highway Milano-Venezia is critical. The "Forest of Mestre" project plans for the establishment of additional 1,000 ha of forests in the next years. Even if the total forest area being realized through these initiatives is quite limited (few thousand hectares), it will be of high importance for improving the quality of life of urban populations and for restoring peri-urban landscape.

In addition to these programmes, the low quality of the landscape in many intensively used farmland has stimulated all the Northern regions to create special measures to support farmers willing to plant hedgerows.

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

As stated before, there is a basic lack of knowledge on the specific demand for forest services as well as the demand for "green" products by urban population.

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

- Organisations:
  - Universities with permanent groups of scientists carrying on research activities in the field: Turin, Padua, Florence, Viterbo
  - Institutes depending from the National Research Council (*Consiglio Nazionale delle Ricerche*): IVALSA (Florence)
  - Research institutions depending from the Ministry of Agricultural and Forest Policies: INEA (*Istituto Nazionale di Economia Agraria*), ISS (*Istituto Sperimentale per la Selvicoltura*)

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- Information sources:

- Journals: Sherwood, Alberi e Territorio, L'Italia Forestale e Montana, Economia Montana, Dendronatura
- Web sites of the institutions mentioned in he text above
- Web sites of the associations of the wood-working industries: Federlegno-Arredo (panels, sawnwood, furniture), Assocarta (pulp and paper)
- Statistics by ISTAT (Istituto Centrale di Statistica), ECE-FAO Timber Committee, FAO

On line information and publications by some Regional Administrations and Autonomous Provinces (see, in particolar: Piedmont, Lombardy, Veneto, Trento Bolzano, Friuli, Emilia-Romagna, Tuscany, Umbria).

2. Small-scale forestry practises

Official statistics available for Italy do not differentiate between small-scale and large scale forestry, or between Non Industrial Private Forestry, Industrial Private Forestry (IPF) and Public Forests. In fact, IPF is practically unknown in Italy and most of the forests can be considered as non industrial, as we have done in this report.

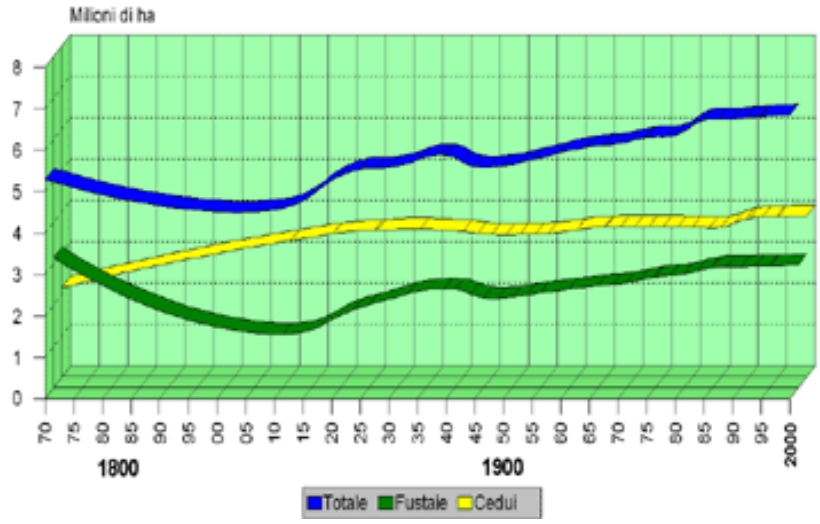
2.1. State of the art and historical development

Italian forests have been a timber reservoir for different populations since pre-roman times. Phoenicians, Greeks, Etruscans and Romans cleared forests transforming them into cropland. After the Romans, several barbaric invasions and natural catastrophes created the conditions for land abandonment and massive forest recolonization. During the Renaissance age, socio-economic standards improved and forests were cleared again for crops, pastures and urban settlements.

Only sixty years after the Italian unity (1861) the central government was finally able to conceive a forest policy and the publication of important laws, still in force today (Colpi et al., 1999): nowadays, the most important law is a national one (dating 1923) (but forests are managed by regional regulations).

2.2. Small-scale forest holding

During last 130 years the Italian forest area is increased from 5,300,000 hectares in 1870 to 6,860,000 hectares in 2000 (see Figure 1).



Blue= total Green= High stands Yellow= coppices
(Source: Statistics Office of State Forest Service)

Figure 1. Forest surface development from 1870 to 2000

Such increment is mainly quantitative, since coppice forests prevail and represent nowadays 57% of the Italian forests. After a constant decreasing of forest lands, since the end of 1st World War (1919) an increment was recorded and forest area progressively increased until 1945. From the ‘50s, forests started again to extend, mainly because of vegetative colonisation on abandoned agricultural lands (Source: Sstatistics Office of State Forest Service).

Two main sources of information on the forest cover structure and distribution are available in Italy (Colpi et al., 1999):

1) the National Forest Inventory (NFI): carried out in 1985-86, the NFI make out 8.6 million hectares of forests (Mha) (Table 1); it must be pointed out that the NFI adopted a quite wide-ranging definition of forest, since it also consider as forests those lands covered by shrubs or scattered trees;

2) the National Institute of Statistics (NIS): NIS publishes annual data on forest land extension (the most recent data is of 6.8 Mha), including only the forestland within non-abandoned public and private farms (Colpi et al., 1999).

Table 1 - Forestland categories and their extension

category	surface (ha)	%	type	surface (ha)	%
high forests	2,178,900	25.1	even-aged	1,176,300	54.0
			uneven-aged	554,400	25.4
			irregular	377,100	17.3
			transitory (in conversion)	71,100	3.3
coppice forests	3,673,800	42.3	simple	2,751,300	74.9
			with standards	922,500	25.1
specialised production	288,900	3.3	timber	134,100	46.4
forests			non-timber products	154,800	53.6
other forests			rocky	575,100	26.6
	2,160,900	24.9	riparian	110,700	5.1
			shrubs	1,475,100	68.3
non-wooded inclusions	372,600	4.3			
Total	8675100	100.0			

Source: ISAFA, 1985.

However, natural conversion of abandoned agricultural and range land to forest is by large the most relevant form of in land-use change in Italy. This is confirmed by other sources of information, such as the Corine Land Cover 2000 survey, which detected 7,2 Mha of forests (9.4 Mha considering also shrubs and scattered trees).

Most recent estimate is EUROSTAT – 1998, based on a common international definition of forest (minimal cover 10% and minimal surface 0,5 ha), which reports for Italy a forest area of 9,857,000 hectares: of such area, 6,860,000 hectares are high stands, coppices and shrubs and maquis, while the remaining part is represented by small woodlots (rocky, riparian forests or shrubby vegetation) (Source: Statistics Office of “State Forest Service”).

Besides natural woodland, where native and spontaneous species are dominant, there is a remarkably large area of forest plantations with a strictly timber–production purpose, which had a great influence on the Italian forest-wood chain system during the last decades. A distinction can be made between fast growing plantations of timber or wood-pulp production, especially those of poplar in the Po valley which have a rotation length of around 10 years, and plantations aimed at the production of particularly valuable timber (walnut, cherry, ash, maple etc.), which have a longer rotation length, which in total cover 162,652 ha (ISTAT, 2000).

According to the general census of agriculture (ISTAT, 2000) the number of agricultural farms which possess forests is 605,222 with an average surface of 7,51 ha, mostly distributed in the smaller class of surface average (< 5 ha, see Table 2).

As in many other western countries, Italy's economy has strongly shifted from primary and secondary to tertiary activities. Only 7% of the labour force is employed in agriculture, 32% in industry and over 61% in other activities, contributing respectively to GDP for 3.5%, 29.2%, 67.3% (Colpi et al., 1999). On the basis of the Italian national accounting system, GNP from forest related activities (wood and non-wood forest products) represents only 1.3% of the primary sector GNP and 0.05 % of total GNP, while the GNP of the wood working sector is about 4.5% of total GDP. Italian GDP does not take into account any non-market public service provided by the forest sector, like erosion control, water conservation, landscape and biodiversity protection, etc.

Table 2 – Land structure of agricultural farms with forests

size			%
< 5 ha	Forest surface	258,018.62	5.67%
	Number	361,375	59.71%
	average surface	0.71	
5-20 ha	Forest surface	498,938.43	10.97%
	Number	168,073	27.77%
	average surface	2.97	
20-100 ha	Forest surface	748,153.88	16.45%
	Number	62564	10.34%
	average surface	11.96	
> 100 ha	Forest surface	3,043,047.91	66.91%
	Number	13,210	2.18%
	average surface	230.36	
Total	Forest surface	4,548,158.84	
	Number	605,222	
	average surface	7.51	

Source: ISTAT, 2000

Forest land in Italy is divided into private (60%) and public ownership (40%). Local municipalities are in possession of large proportion (68%) of publicly owned forests. The average size of privately owned forest properties is 7.51 ha (General Census of Agriculture, 2000). Privately owned woodlands are usually very scattered and rarely keep a forest management plan. This represents the main problems for an active management of the forest resource.

Italian forests grow annually of approximately 30 million m^3 of timber, but only 1/3 of this mass is harvested. Main causes are lack of infrastructures (roads, etc.), difficulties of access , strict regime of protection for protected areas, insufficient economic value of wood.

As in other Mediterranean countries, the social and economic role of non-wood forest products (NWFP) is traditionally of high importance for local communities. Market demand for chestnuts, hazelnuts, mushrooms, truffles, berries is so high that almost all the Regional Administrations have introduced property right regulations to control the collection of NWFP. These products are no more a public, free-access good, but products that can offer remarkable source of income to the forest owners and their association (Colpi et al.. 1999).

Soil and water protection is the most important goal in Italian forest management, due to the very irregular morphological features of the country. At the same time people's demand for recreational and natural use has significantly increased during the last decades.

The NFI distinguishes Italian forests on the basis of the prevailing function, as shown in Table 3.

Table 3 - Woodland categories and prevailing functions

Category	prevailing function (%)			
	production	protection	ecological	recreational
high forests	72.7	18.6	8.5	0.3
Coppices	82.2	14.3	3.5	0.1
Plantations	100.0	0.0	0.0	0.0
other forests	4.8	89.3	5.7	0.2

Source: ISAFA, 1985.

Italian forests are indeed multifunctional, but very few data are available on all the public functions.

Italy hosts three of the bio-geographic regions recognised by the EC Directive Habitat, thus it hosts a wide varieties vegetation types (150). Referring to the management system, coppice is predominant in the centre of the country and comprises around 53% of the total forest area; high forests about 43%, mainly in Alpine stands; the remaining 4% is covered by shrubs and maquis in coastal areas and islands.

Statistic data concerning NWFP are not reliable, there are not regular surveys and mainly these products belongs to small scale economies.

There are no precise data on revegetation and natural forest expansion which interest about 2 or 3 Mha of previous agricultural lands.

A seconf NFI, carried out by the national Forest Service, will be completed by the end of 2005. It has been designed to encompass information and data to accomplish the Forest inventory is outdated.

2.3. Small-scale forestry practices

In order to describe forestry practices and draw relevant strategies of owners we can use 4 main typologies of private properties (beyond public properties, mostly municipal approximately 1.8 Mha where protection, landscape and environmental objectives are more important ones). Private properties can be divided in:

- totally abandoned forests (1,2-1,6 Mha), and hundreds thousands of has of abandoned agricultural lands, covered by shrubby vegetation, in natural conversion to forests. for these areas no objective is actually understandable;
- properties not managed, because of their very small dimensions (351,000 has in 464,000 farms) for which objectives are, at least, fuel wood auto consumption;
- forests belongings to agro-forestry farms, mostly in hilly or mountain areas (1,5 Mha, 299,000 companies) where forest keeps the traditional yield-integration role of the agricultural activity;
- poplar cultivations and arboriculture, distributed mostly in ex-agricultural lands, where objectives are production and owners are very interested at the EU financial support.

Only 23.2% of the Italian territory is flat land, where intensive agricultural production systems and urban land uses are predominant. About 60% of the forests are situated in mountain areas, 35% in the hills and only 5% in the plains. Soil and water conservation is the main goal and constraint of forest management. In fact forestry practices are carefully controlled and restricted by specific rules, aiming at a sustainable planning and management of forest land. Silvicultural systems are based on “close to nature” principles which must simultaneously respect social – economical

development and the enforcement of soil protection and water conservation, in other words the multi - functionality of the forest ecosystems. Therefore, clear-cutting of high forests is forbidden, since 1923, and operations leading to natural regeneration, such as selection systems and shelterwood systems (group, strip and edge), are strongly encouraged. Coppices are most commonly managed on a rotational basis, when the stumps are clear-cut, but several trunks known as standards are left, distributed evenly over the land for partial coverage of the soil and for dissemination.

In natural or semi-natural forests, which are mostly localized in mountain and hilly regions, choices and technical possibilities are very restricted, not only by regulations, but by several real boundaries. So, sylviculture and wood harvesting practices are affected: mechanization level is lower than in other countries and often stumpage prices are negatives.

During last years, the problem of old coppices management arises: although still common in Italy, coppice is currently considered an outdated silvicultural system. The reasons are that its products are largely surrogated by other manufactured items and especially it doesn't guarantee, as well as high forests, the multiple functions that public opinion expect from forests (soil-erosion control, landscape amenity and recreation) (Colpi et al, 1999). More and more old coppiced stands in Italy are subjected to conversion operations leading to high forest. Generally conversion begins with thinnings in coppices that are by large older than their usual rotation age. When stems are relatively old, soil has improved and seed production is abundant the shelterwood system can then be adopted. Unfortunately the coppices conversion is a long and expensive activity and, therefore, very rarely is appreciated by private owners.

Another important aim of Italian forestry is to foster natural diversity and evolution in forests; therefore mixed forests are promoted and the spontaneous recolonization of broadleaved species in coniferous plantations is today strongly encouraged. (ibidem).

At smaller scale forestry management rules are based on tradition, Harvesting id contracted to forest workers as small family business. Great hopes are set on new developed Forest Co-ops or Consortia (in most cases supported for development by public funds).

From the beginning of the 1990s there has been an important increase in the number of forest associations and unions: Federforeste (National Federation of Forest Associations) in June 2000 included 62 enterprises, with a total surface area of 400,000 has. This seems to be a fundamental way to help overcome the difficulties and limitations of land fragmentation, which must be strongly enhanced in the future in order to reduce total costs and make local timber more competitive on the market.

Most important reasons for associating are related to problems deriving from high property fragmentation and the necessity to supply services to the owners and to the managers (Musotti and Petrella, 1996):

- normative functions (supply contracts; quality marks; certification of the management systems);
- operating functions with internal relevance (technical and professional skill, equipments, management plans; plantations, tending, harvesting and transformation operations for associate partners; maintenance of systems and infrastructures; surveillance and defense services);
- operating functions with external relevance (concentration of the wood supply; channels of distribution; organization and regulation of tourist-recreational activities; marketing);
- political-administrative functions (predisposition of business accounting; administrative attendance, authorizations, incentives; lobbying actions).
- The share of self-consumption: at small scale almost all non contracted wood is for family fuel and construction timber / agriculture.

It is very difficult to assess costs and benefit of Italian forestry, mainly because of heterogeneous conditions: while a great part of forest stand has negative stumpage prices (like most of the coppices in the centre of the country) other forests have positive balances, like many of the productive high forests (mainly coniferous) in the northeastern regions and several coppices stands.

Relevant examples of forest plantations are the poplar stands in the northern plain areas of the river Po valley: they probably represent financially the most productive investment in the forest sector in Europe with a net annual increment of 20-25 m3/ha, rotation periods of 8-10 years and with the predominant use of the final harvest for high-quality plywood production (Internal Rate of Return of 7-10%) (Colpi et al., 1999).

Owners' investments in small-scale forestry are almost none and the role of forestry in farm activities used to be a complementary job, but now forestry is almost neglected.

The main form of timber procurement is importation! (Normally national forests are sold on stand) Forest activities and wood working industries are separate entities acting rather independently: the lack of integration between the two sectors is due to different policies and patterns of development. Forest activities seem more oriented towards the production of non-market public services than to an increase in the internal supply of wood products. While the wood industry is strictly oriented towards production and competition in the international market by giving as much added value as possible to the raw material imported (Colpi et al., 1999).

Despite the large wooded surface area, the Italian internal supply of timber is limited and not evenly distributed. According to ISTAT (2000), the total amount of utilized timber was 9,242,130 m3, divided into fuelwood (59%) and industrial roundwood (41%). The latter is mainly (70%) represented by broadleaves (45% comes from poplar plantations) and used as sawnwood (53%), panels and pulp (20%), agricultural poles (13%) and other semi-finished products (14%). The significant incidence of industrial roundwood originating from poplar plantations illustrates the low utilisation rate of natural forests. This situation can be due to strict forest policies and particularly to an extremely low technological level of local forest enterprises, that leads as a natural consequence to high harvesting costs, thus making the timber non-competitive with neighbouring countries.

2.4. Policy framework and production conditions

Main forest policy institution is the Ministry for Agricultural and Forestry Policies, in charge of coordination of Regional policies, which are autonomous. Property rights are basically individual on forestry (public/private), but almost 2 million Ha are common lands, both pastures and forests. Small scale forestry production is not properly considered at present.

Financial incentives for Small scale forestry are not relevant to induce active management. Only in few cases (Autonomous Province of Trento) specific Institutions have been activated to cope with this issue.

Beyond Universities, main research institutions are National Council of Research and Ministry of Agricultural and Forestry Policies while education and training institutions are represented by few high schools, within the professional agricultural system and by 7 universities granting 1st and 2nd level degrees in Forestry Sciences.

There are no extension services, both for agriculture and forestry as such. Some activities in dissemination of cultural practices and EU policy implementation. Many private consultants dealing with advisory, planning and managerial activities, Forest co-ops are active in this area.

National State forests have been recently transferred to Regional authorities. Great heterogeneity in management, opening to public, activities, little effort in extension work.

2.5. Supporting and limiting factors for enterprise development in small-scale forestry and barriers to entrepreneurship

The high incidence of utilization costs in such a fragmented woodland, the difficulty in harvesting a sufficient volume of timber per surface unit, the low density of forest roads and the general poor quality of timber are limiting private and often public bodies in undertaking an active exploitation. The final result is that the progressive increase of forest land corresponds with a decreasing interest of the owners for the continued management of such important resources.

Large spaces for increasing forest productions are possible in Italy and two are the main solutions: the valorisation of the existing wood resources and the development of new systems with an efficient arboriculture. Existing forests are largely underutilized and the role of the owners in their management is in constant decline. Many forest stands need human action, at least in order to reduce risks related to abandonment as fire.

Public agencies cannot continue to carry out the role of financing forest managers, because of progressive reduction in available funds and therefore it is indispensable improve private involvement, through economic motivations and participations in management and decisions.

Annex B: Organisations studying small-scale forestry and main publications and information sources.

See annex A, also for pubblications quoted in part 2.

3. Wood-processing industries

3.1. State of the art knowledge and historical development at country and regional level on wood processing industries and related policy framework

Forest, wood processing and furniture industries in Italy are included in a production chain characterized by relevant discrepancy between local (domestic) supply of wood and demand for industrial transformation or final consumption.

In particular, must be recalled that domestic production is un-sufficient to satisfy industrial demand, and about 70% of industrial raw material is imported.

On the basis of official statistics, forest area in Italy is , about 6.85 Mha, including private properties, regional and state properties and municipalities.

As shown in table 1, the main part of forest land is located in mountains and hills. Most of these woods are coppices or maquis, from which the main product is firewood. High forest, both coniferous and broadleaved is around 38% of the total, mostly located in mountain areas. Soil and water conservation is, at the same time, the main objective and constraint of forest management in these areas. Strict regulations (i.e. only light selective fellings and silvicultural regimes based on natural regeneration, prohibition of clearfellings, limitations in forest road construction) are imposed on 92.4% of the forest land.

Table 1. Forest area by zone

	Mountain		Hill		Plain		Total	
Forest Area	59.84%	*%*	35.19%	*%*	4.97%	*%*	100.00%	*%*
Coniferous forest	1171277	*28,88%*	217662	*9.13%*	50811	*15.10%*	1439750	*21.25%*
Broadleaved forest	674721	*16.64%*	353614	*14.83%*	129570	*38.51%*	1157905	*17.09%*
Mixed forest	220893	*5.45%*	114819	*4.81%*	15328	*4.56%*	351040	*5.18%*
Coppice	1585352	*39.10%*	1154624	*48.41%*	81147	*24.12%*	2821123	*41.63%*
Coppice with standard	386188	*9.52%*	361653	*15.16%*	32900	*9.78%*	780741	*11.52%*
Maquis	16563	*0.41%*	182543	*7.65%*	26704	*7.94%*	225810	*3.33%*
Total	4054994	*100.00%*	2384915	*100.00%*	336460	*100.00%*	6776369	*100.00%*

Source: ISTAT, 1995 – Forest Statistics

According to the recent agricultural census (2000) the wooded area of agricultural firms has decreased in the last decade of about 14%, while the total number of agricultural firms that own or manage forests has decreased of about 18%. This is manly due to the fact that collection of data in agricultural census is based on an interview to the farm owner/manager, so the decrement in the number of active farms has a direct consequence in the surface of managed forests as reported in the Census.

The economic role of forest sector in Italy is rather low. On the basis of the Italian Accounting system the Gross National Product from forest related activities (wood and non wood forest products) represents only 1,2% of GNP of primary sector (average of last 20 years) and 0,05 of total GNP. GNP of the wood working sector is about 6% of national GNP. Wood related economic sector operate in a highly disconnected forestry wood system, whose main features are:

- a very high internal industrial demand, averaging 15 million m3/year. Timber consumption mainly flows into two “wood chains” (or filières): on one hand the timber- building/furniture industries filière, on the other the timber-pulp and paper industry -printing industry filière. In

both cases Italy behaves as a strong net exporter of some finished products: it is first in the world for exports in the furniture sector, while it holds a well-consolidated leadership on the European and North-American markets for exports of other wood-products;

- fragmented and episodic internal supply, due to the above-mentioned economic and environmental constraints; moreover the internal supply is not homogeneously distributed. Most of the productive high forests (mainly coniferous) are in the north-east, while coppices predominate in the centre of the country. The only relevant examples of forest plantations are the poplar stands in the Northern plain areas of the Po valley. By contrast with the overall situation of wood productivity in Italy, poplar plantations probably represent the most productive investment in the forest sector in Europe;
- a consequent low self-sufficiency rate, i.e. around 35% for semi-finished products; part of the reason for this, beside the economic and environmental constraints, is the fact that Italy's geographical position and international location is such that imports from neighbouring markets (mainly Austria, Croatia and France) are easier and more rapid than purchases on local markets. Furthermore, due to the size of production, the wood, furniture and pulp and paper industries need continuous, homogeneous and reliable timber provisions, which can only be guaranteed by foreign supply.

Due to the economic framework, the current situation of wood processing industries is rather differentiated between forest activities and first processing on one hand, and manufacturing on the other hand.

In principle, much of data on the production chain are not available in the official statistics, in particular those referred to harvesting enterprises, methods and equipment.

Harvesting and first processing is less developed than the second part of production chain. Total number of enterprises is estimated to be around 8.700 (source infoimprese – Union of Trade Chambers- no official statistic available).

Average annual harvesting is the only information available in the official statistics, on average the annual harvesting is between 9 and 7 millions cm, but many authors agree that data reported in the official statistics may represent only half of the actual harvesting. In rural areas, firewood production is an important underground economy, developed locally within small close circuits;

3.2. General information on wood processing industries in the country

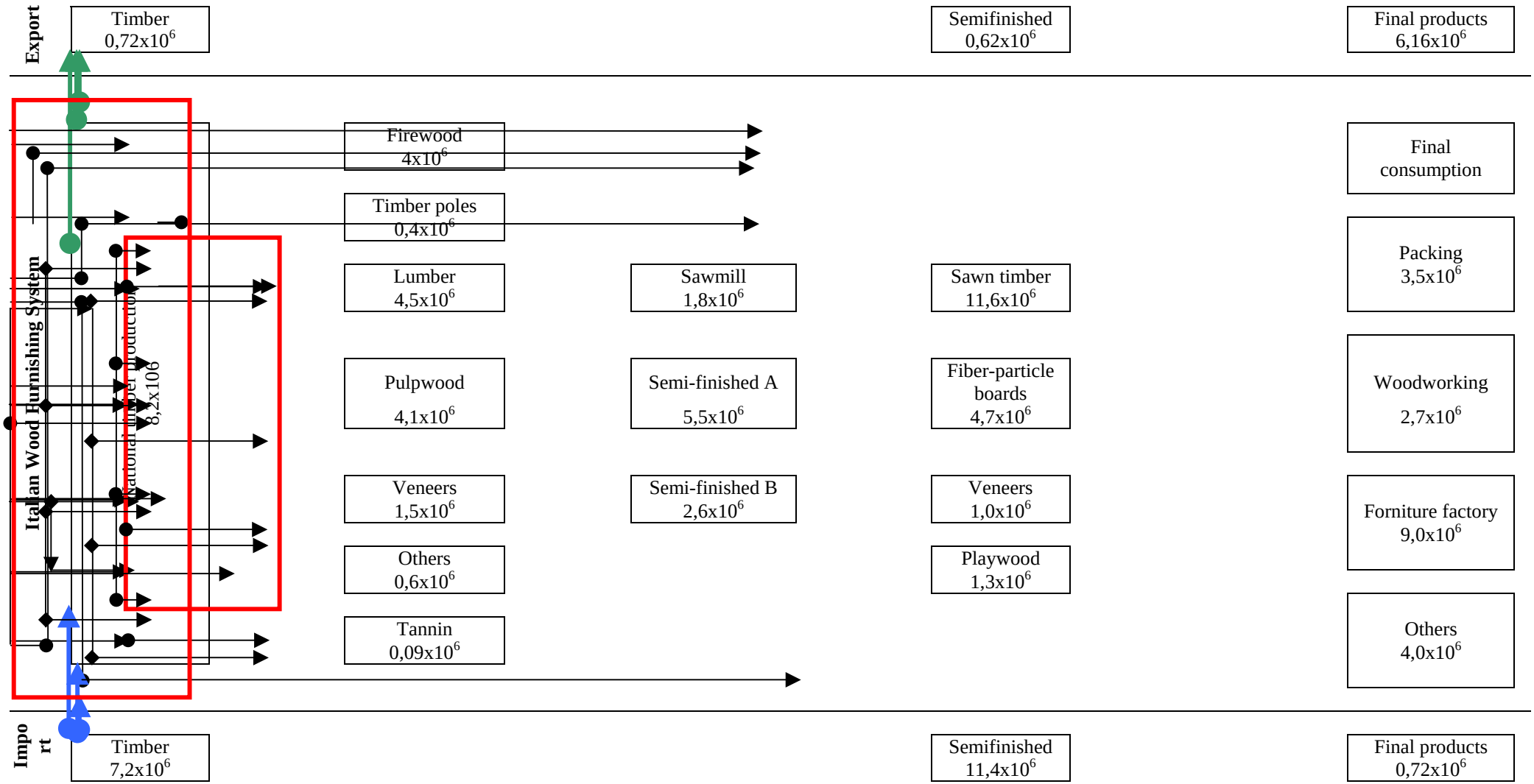
The Italian wood industry is the result of an age-old manufacturing tradition in the wood working. Most of industries operating in the sector has more 100 years of working experiences, a quantity of them are still handcraft firms, while only a few has in the last decades reach the status of proper wood industries.

Figures in table 2 show summarize strong and weak points of the wood Italian sector.

Table 2. Italian forest-wood manufacturing sector in figures

Production value	Million €	38.100
Export	Million €	12.578
Import	Million €	5.463
Balance	Million €	7.115
Employment	Unit	413.782
Employment into firms with more than 20 employment	Unit	128.278
Firms	Number	87.900
Firms with more than 20 employments	Number	2.865

Source: Federlegno-Arredo, 2003.


Export
Timber
0,72x10^6
Semifinished
0,62x10^6
Final products
6,16x10^6
Firewood
4x10^6
Timber poles
0,4x10^6
Lumber
4,5x10^6
Sawmill
1,8x10^6
Sawn timber
11,6x10^6
Pulpwood
4,1x10^6
Semi-finished A
5,5x10^6
Fiber-particle boards
4,7x10^6
Veneers
1,5x10^6
Semi-finished B
2,6x10^6
Veneers
1,0x10^6
Others
0,6x10^6
Playwood
1,3x10^6
Tannin
0,09x10^6
Italian Wood Furnishing System
National timber production
8,2x106
Final consumption
Packing
3,5x10^6
Woodworking
2,7x10^6
Forniture factory
9,0x10^6
Others
4,0x10^6
Import
Timber
7,2x10^6
Semifinished
11,4x10^6
Final products
0,72x10^6

From the structural characteristics point of view, the productive industry sector cover all the phases of the production chain. It is composed by 87.900 firms with more than 413.000 employees.

The wood sector is a relevant component in the Italian economy. With his strong contribution to national GNP (on average 5-6%) it is, together with fashion, one of the more important sector of the “made in Italy” in the world.

In the world market of wood furnishing the Italian industries are leader in the export, particularly in the UE market where they usually allocate 60% of productions, of which more than 20% it is exported in German only. More than 15% of the total export reaches non - UE countries, more than half of the former is imported by USA:

The weak point is the raw material (woods) imported by more than 60% of the total wood used. More of 50% of Italian timber production is firewood.

The woods firms (industries and/or handcrafts) are distributed in the whole of Italy. Moreover from economic point of view, the wood working process is based on small and medium-sized companies and clusters (industrial districts with high level of specialisation/integration of industries). Triveneto (Veneto, Friuli Venezia Giulia, Trentino), Lombardia (Brianza), Toscana, Marche e la Puglia are the major geographic areas where the districts are located. These areas generate 60% of the Italian export.

3.3. Wood processing industries practices

In Italy, on the basis of recent investigation (no official statistics exists on this issue) there are 8.000-9.000 forest enterprises that employ around 24.000-28.000 forest workers (including both, temporary and permanent jobs). Many of them are private enterprises and the main part of workers are relatives of the entrepreneurs. Irregular work and use of not-professional workers is still a serious concerning in the Country, particularly in some regions. For these reasons forest enterprises are indicated as the weak part of the wood production chain.

The rough material used by industry is, in major part, non-national timber and lumber, however, in many SMEs the national wood is used too, principally in the production of handcrafts.

SMEs are generally managed the owner, and the old-manufacturing tradition is the background. Except the SMEs included in districts/clusters areas, that are used to access foreign market, firms in other areas usually trade in local market.

The recent analysis produced by the National wood furnishing system (Federlegno-arredo) recognize in the *growth*, *strengthening* and *cross-action* the tree developing strategies of Italian firms in the middle term. These could be considered as the answers of the Italian wood and furniture system to the strong pressure of Chinese economy on the furnished market (low costs of production and high technologies bought in Italy an in German).

3.4. Policy framework and production conditions

A short premise must be done about institutional framework in Italy. In the last decade national government has implemented a relevant process of decentralisation. Currently the process is not completed, particularly concerning the last part (decentralisation to Provinces and Municipalities). However most of development policies (rural and regional development) are currently implemented at regional level. The role of central administration is limited to coordination of regional policies, it acts as representative body with respect to EU institutions, and, only for some measures, mainly in the industrial sector, central administration keeps the role of policy maker.

(a) main wood industry policy institutions that directly influence wood processing

Low relevance: the only political body active in the sector is CNEL (National Council for Economics and Labour), with an Observatory on the forest sector.

(b) main reform policies - privatisation, liberalisation of prices and of international trade that affected the wood industry development

Not applicable

(c) main policy (incl. financial) incentives available to wood industry that directly influence management behaviour

Only general policies for SMEs are included in regional development policies. No policy or incentive directly targeted to wood industry exists.

(d) main regional policy / rural development institutions that are known to be active in wood industry SME support

At the first stages of production chain (forest harvesting enterprises and sawmills) policy implemented and measures activated are part of rural development policies. Within the category of forest measures aids and incentives for timber transformation and commercialisation are included in all 21 regional Rural Development Plans.
Ad can be seen in table 3 almost all Italian regions have adopted in RDP at least one measure to improve forest exploitation and wood harvesting. Most measures are, *de facto*, strictly comparable to those implemented under CE Reg. 867/90.

Table 3 - "Other" forest measures in Regional RDP in Italian ob.2 regions

		Piemonte	Valle	Lombardia	P.A.Trento	P.A.Bolzano	Veneto	Friuli V.G.	Liguria	Emilia R.	Toscana	Umbria	Marche	Lazio	Abruzzo
other forest measures	afforest. non agricultural land	X	X	X	X		X	X	X	X	X	X	X		X
	forest improvement	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	forest planning and inventories		X	X	X			X	X			X	X	X	
	forest exploitation and wood harvesting	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	eco-certification and production chains	X	X	X	X	X	X	X		X		X		X	
	infrastructures and forest roads							X	X			X			X
	forest association and consortia	X	X	X	X	X	X	X	X	X	X	X	X	X	
	reconstruction after forest fires	X		X	X		X	X	X	X	X	X	X	X	X
	manteinment of forest stability	X	X	X	X	X	X				X	X			
	fire prevention	X		X							X	X	X		

Moreover some specific measures are implemented by the regions, however the financial resources for these measure are rather limited.

(e) research institutions and their main competencies

3 main categories: University (Engineering, forest science, firm economics and management), research institutes of Ministry of Agriculture, some research activity done by private bodies (Federlegno – national association of wood sector enterprises).

(f) education and training institutions

Main institution active in education are Universities. Forest Sciences is currently in the curriculum of 12 Italian Universities. The degree has been recently reformed to adapt to the European standard. Now the courses are organized on a 3+2+1 years. Some of the universities offer a technical degree in wood technology/wood industry, limited to bachelor (3 years), and generally organized on the basis of agreements with industries and their association.

Secondary technical education (and training) is organized by regions and financed, according to the case, by EU Social Found, Regions, and, in small part, by industrial sector.

(g) extension services (incl. rural and regional development) and consulting institutions

Agricultural sector has a long tradition of extension services, but this is generally limited to agricultural firms. In forest activities some kind of extension is done by regional agencies while in wood processing industry there is no organized extension service

(h) the degree of bureaucracy measured for instance by the number of applications for R&D between different actors in supporting enterprises; number of projects started per number of applications

No data or information are available.

Annex C: Organisations studying small-scale forestry and main publications and information sources.

See Annex A.

4. Non-wood forest products and services

4.1. General information on forest related non-wood products and services in the country

(a) Historical development of non-wood forest products (NWFP&S) and services in the country
(b) NWFP&S definition, classification and relevance in rural economies

Historically, non wood forest products (NWFP) are of high importance in Italy. Change factors differ from product to product. In general urbanization processes and loss of traditions caused also in Italy the decline of collection of NWFP. But for some products, considered more as a recreational service than a commercial good, demand has remarkabaly increased. Most of the non-food products lost their importance (Table 1).

Diseases caused production losses of chestnut in the middle of the 1980-ies. In the process of NWFP valorisation an important role has been the revision of property rights. Specific laws for gathering mushrooms for example were established, because population pressure were to high (Croitoru and Gatto, 2001).

Table 1: Production of NWFP in Italy 1950 – 2000 (ICS, 1951, ISTAT, 1961, ISTAT, 1971, ISTAT, 1982, ISTAT, 1993, ISTAT, 2003)

		1950	**1960***	**1970**	**1980**	**1990**	**2000**
Chestnut	[1.000 tons]	228.4	165.7	58.7	63.4	49.6	63.2
Hazelnut	[1.000 tons]	1.3	46.7	0.8	1.4	8.0	14.2
Pine nuts	[1.000 tons]	3.2	3.8	3.7	1.6	1.9	3.3
Mushroom	[1.000 tons]	3.5	9.1	7.7	1.2	1.8	1.1
Truffle	[tons]	30.4	76.4	83.8	71.4	107.4	97.9
Acorn	[1.000 tons]	62.8	92.9	0.5	13.7	4.0	2.7
Bark for tanning	[1.000 tons]	4.0	1.2	0.1			
Leaf and Twigs for tanning	[tons]	551.3	300.0	158.5			
Resin	[tons]	738.4	30.0	12.3			
Cork**	[1.000 tons]	12.8	12.3	15.2	15.4	7.8	14.5
Medical plants and aromatic herbs (roots, flower, other parts)***	[1.000 tons]	9.3	3.3	1.0			
Leafs and herbs for fodder and stables***	[1.000 tons]	10.0	15.4	0.8			
"*Corbezzoli*" (seed of *Arbutus unedo*)	[tons]	194.3		36.9			
Juniper berries	[tons]	678.8		132.6			
Blueberries	[tons]	367.6		346.0	522.8	73.2	125.8
Strawberries	[tons]	503.9		351.3	78.0	82.2	212.4
Raspberry	[tons]	494.3		203.7	90.0	59.2	64.1
Manna	[tons]	88.3					
"Corniole" (legumes of *Ceratonia siliqua*)	[tons]	59.9					

"Faggiola" (fruits of *Fagus sylvatica*)	[tons]	120.1					

* 1960 forests and other land together
** "*sughero gentile*" and "*sughererone*" together
*** Summarized

Prices of the same product differ very much by regions (Table 2). Usually regions with long traditions of production and the highest production rates have the highest prices.

Table 2: Production and Value of the main NWFP in Italy 1999 (ISTAT, 2002; 1 €=1936,27 lire)

Product	Amount [tons]	Value [1 000 000 €]	Price [€/ 1 000 kg]		Main regions of production
			Medium	Min - Max	
Chestnuts	52 200	40.5	775	425 – 2 610	Campania, Lazio, Calabria, Piemonte, Toscana
Hazelnutss	20 100	30.3	1 505	995 – 2 540	Sicilia, Lazio. Campagna
Umbrella pine nuts	4 861	7.9	1 615	250 – 1 785	Toscana, Campagna, Lazio
Mushroom	1 903	18.7	10*	6 - 15*	Toscana, Emilia-Romagna, Lombardia, Trento, Calabria
Truffles	86	18.3	212*	37 - 716*	Umria, Abruzzo, Marche, Piemonte, Emilia-Romagna
Acorns	29	1.1	380		Sardegna
Cork	13 528	13.8	1 330		Sardegna, Calabria, Campagna
Blueberries	324	1.3	4*	2 - 12*	Emilia-Romagna, Piemonte, Trentino- Alto Adige
Strawberries	338	0.9	3*	2 - 10*	Piemonte, Trentino- Alto Adige, Bolzano
Raspberries	121	0.4	3*		Trentino- Alto Adige, Bolzano, Trento

* Price per 1 kg

According to the NFI, 2% of the forest area was specific for production of NWFP. 17 100 ha (or 0,2 % of the total forest area) were classified as forests with prevalent touristic–recreational function (Table 3). Table 4 shows the distribution of forest that have prevalent function for tourism and recreational by management system.

Table 3: Distribution of main forest functions [%] (ISAFA, 1985)

Wood production	58.1
Production of non wood forest products	2,1
Protection	34.4
Ecological	5.2
Tourism/Recreation	0.2

Table 4: Forest area prevalent for tourism and recreational function (ISAFA, 1985)

	Tourism/ Recreation [ha]	Total [ha]	Tourism/ Recreation [%]
High forests	7 200	2 178 900	0.3
Coppice	4 500	3 673 800	0.2
Other	5 400	2 548 800	0.2
Total	**17 100**	**8 401 500**	**0.2**

Considered that the total forest surface amounts to 6.9 Mha and that Italian population consists of 56.4 million inhabitants, forest area for one inhabitant amounts to 1,200 square meters.

In average, Italian people spend 4 times a year and every time 3 hours and 45 minutes in the forests for tourism and recreational reasons. The number of visits is decreasing from the North to the South of Italy. 2% of the visitors of Italian forests are people from foreign countries (Scrinzi *et al.*, 1995). Table 5 shows the main activities during the visit of the forest.

Table 5: Activities during the visit of the forest (Scrinzi *et al.*, 1995)

Main activity	**Number**	**Average time**	**Recreational use**	
	[%]	**[hours and minutes]**	**[1 000 000 hours per year]**	**[%]**
Break in special rest areas	5.8	2.11	45.7	7.2
Break in other areas	10.2	2.15	84.7	13.4
Break in refugees	2.2	2.14	18.2	2.9
Free camping	0.8	2.33	7.1	1.1
Walking (without any special objective)	21.9	1.35	107.6	17.0
Excursion by feed	21.7	2.04	124.5	19.7
Excursion by bicycle	2.9	1.25	13.5	2.1
Excursion by ski	0.6	1.44	3.5	0.6
Riding	1.1	1.12	5.1	0.8
Climbing	1.0	2.17	6.6	1.1
Walking (sport)	1.7	1.26	8.0	1.3
Photography (nature observation)	8.2	1.47	53.0	8.4
Gathering of mushrooms	9.9	2.09	64.6	10.2
Gathering of other products	6.3	2.10	48.6	7.7
Hunting	1.7	2.03	12.0	1.9
Fishing	1.1	1.50	6.4	1.0
Other	3.3	2.15	22.0	3.5
Total	100		631	100

Only few studies exist about economic evaluation and relevance of NWFP&S in rural economies.
Farolfi (1990) examines the role of gathering mushrooms in Casentino area (Tuscany). For low-income classes, which consist mainly of housewives and pensioners, gathering mushrooms provide the whole income or 30% of the income respectively. Only higher age classes were represented within the mushroom collectors, nobody was younger than 30 years, the main part was between 50 and 60 years old, 70% were women. About 20% of the total harvest is used for eating, and the remainder is sold to local stores, on markets, to restaurants and private customers.

Croitoru and Gatto (2001) determine the value of hunting, mushroom gathering as well as recreation activities, hydro-geological protection and carbon sequetration for Italy (Table 6).

Table 6: Value of selected NWFP&S (Croitoru and Gatto, 2001)

	Method	**Value [1 000 €]**
Hunting	285.000 hunters in mountain areas;	71 250

	250 €/ hunter	
Mushrooms	3 kg mushroom/ ha; 4.000.000 ha of mushroom producing forests	60 000
Recreation	48.000.000 days/ visitors; 2.5 € per visitor	120 000
Protection	Costs for restoration of degraded forests	1 321 500
Carbon sequestration	3.1 Mio. T C stored in Italian Forests; 19.3 €/ t opportunity costs	60 000

(c) Property rights regulation system (access)

After the recent review of the Italian Constitution the state authority has transfered all the competency in the forestry and hunting sectors to the regions (Italian constitution, Art. 117). Still the state maintains a role in providing a general planning framework in the sector.

Access to non protected areas (L[1] 431/1985)	**Access to parks and reserves (L 394/1991)**	**Acquisition of natural products**
- public forests are under regulation of regions or local authorities - restrictions on access can be imposed to forests in general or particular forests - a general right to free access does not exist	- free access for natural parks and reserves of the state - access can be restricted due to nature conservation, limitations for groups - detailed regulations are up to the natural park authority (Ente Parco)	- traditional right of common enjoyment of lands (usi civic, L 1766/1927) 2 categories: 1) essential uses for basic needs (grazing, gathering of wood or fruits); 2) uses for economic purpuses - admitted for personal and family needs (L 3267/1923)
Concerning private landowners		
- restrictions apply also to private forests, but not to private landowner himself (principles of private property) - regional law cannot explicitly permit access to private forests, it is accepted by landowners as long the owner did not ban other persons by enclosures	- landowners have to tolerate access, - possibility of compensation for restrictions to agro-forestry and other activities; no compensation for free access (Art 15 L 394/1991)	- forest owner has the possibility to 1) prohibit civic uses by contracts or 2) transfer a share of forests property to the holder of civic rights - civic uses are managed by special economic plans taking into account laws, parks and reserves, landscape protection as well as regional laws referring to gathering of natural products

Hunting: The state is the owner of the game. The state sells licenses for hunting meanwhile the regulation and control is laying under the responsibility of the Regions or Provinces. Hunters have free access to private forests if they are not closed for different purposes. National Law (*Legge Nazionale*) 157/92 gives possibility to sell the hunting rights to special hunting enterprises (*Aziende Faunistico-Venatorie*). The number of hunters was permanently decreasing from 1.5 million in 1986 to almost the half in 1999 (821.000 hunters) meanwhile the number of hunting enterprises is increasing (ISTAT, 2003).

National frame laws exist for gathering mushrooms (L.N. 352/1993), truffles (L.N. 752/1985) and medical plants (L.N. 39/1931). Provinces have set up regional laws to these objects; in addition regulations exist for berries and other plants at regional or park level (e.g. Toscana LRT 56/2000).

[1] L = Law (*Legge*)

For gathering mushrooms governmental bodies (Provinces, Mountain Communities[2], Municipalities) sell daily or seasonal permissions for collection (prices for daily permissions for collectiong no more than 2 kg range from 4 to 7 € per person). In some regions permission is for free and residents can be favored (reduced fee, largest quantities allowed etc.). The law contains specific limits for amount and time of collection for selected species. In some regions, e.g. in Piemonte the regional law states, that money from picking permits has to be transferred to land owners.
Collection of natural products is generally forbidden in private gardens, forests near houses or when cultivation is professional and licensed (e.g. Truffle). Restrictions usually do not apply to forest owners, they may pick up unlimited quantities without permit or a permit free of charge (Mantau et al, 2001, p. 452-455).

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

Web-pages and Institutions

Name	Area	Information	www
Italian Association of Farmers (*Confederazione italiana agricoltori, CIA*)	Italy	General information	www.cia.it
Ministry of Agriculture an Forest Policies (*Ministero delle Politiche Agricole e Forestali, MiPAF*)	Italy	Law Certification of Products (IGP, DOC), Policy	http://www.politicheagricole.it/
National Institute of agricultural economics (*Istituto Nazionale di Economia Agraria, I.N.E.A.*)	Italy	Actual problems	http://www.inea.it/
National Institute of Statistics (*Istituto Nazionale di Statistica, ISTAT*)	Italy	Detailed data about production and value of NWFP by region	www.istat.it
State Forest Service (*Corpo Forestale dello Stato*)	Italy	Statistics and development of some NWFP, Forest functions	www.corpoforestale.it
Institute of Biology, Agro-Environment and Forestry (*Istituto di Biologia Agro-Ambientale e Forestale, IBAF*)	Italy	Ecological and economic Aspects of agroforestry systems Rural development	http://www.scienceflash.it/ibaf/cnr.php
Experimental Institute for Forest Planning and Alps (Istituto Sperimentale per l' Assestamento Forestale e per l' Alpicoltura ISAFA)	Italy	Forest Functions (Tourism, Recreation) National forest inventory (NWFP&S included, currently no data about last inventory (1998) available)	www.isafa.it
Regional Agency for Development and Innovation in Agriculture and Forestry (*Agenzia Regionale per lo Sviluppo e l'Innovazione nel settore Agricolo-forestale, ARSIA*)	Toscana Region	Law, general information	www.arsia.it
Regional Agency for Development of Agriculture (*Agenzia Regionale Servizi Sviluppo Agricolo, ARSSA*)	Abruzzo Region	Law, general information	www.ruralnat.it

[2] Communita montana = assocoation of municipalities in mountain areas

Articles:

Author	Title	NWFP&S	Information
Baglioni, F., 2000	Piante tartufigene: a che punto siamo? Sherwood N.58/ 2001	Truffles	ecology, some laws
Bounous, G., 1990	Piccoli frutti per le zone collinari e montane. Monti e Boschi N.1 1990, 15-25.	Berries, other plants	Information about ecology and cultivation techniques, fruits of minor importance, cultivation as production alternative
Croitoru, L., Gatto, P., 2001	Una stima del valore economico totale del bosco in aree mediteranee. Monti e Boschi N.5 2001, 22 – 30.	Services	Estimation of the value of non wood forest products, hunting, forest functions, Carbon uptake in Italy
Farolfi, S., 1990	Ruolo economico deo prodotti secondari spontanei del bosco: un' indagine nel Casentino. Monti e Boschi N.1 1990	Mush-rooms	Survey about the role of mushroom gathering
Gottardo, E., Maragon, F., 2001	Metodi e procedure per la quantificazione del danno ambientale alle fisorse forestali. Sherwood N.68/ 2001, 43-46.	Services	Economic evaluation of forest resources incl. NWFP&S.
Mantau, U., Merlo, M., Sekot, W., Welcker, B., 2001	Recreational and Environmental Markets for Forest Enterprises. CABI Publishing. 541 p.	Services	Case studies about marketing of NWFP&S Law
Merlo, M. And Milocco, E., 1998	Lo sviluppo di Prodotti Ricreativo-Ambientali (P-RA) offerti dai boschi: modificazione dei diritti di proprieta o tecniche di marketing? Monti e Boschi N.6 1998, 4-13.	Services	Case studies about marketing of NWFP&S
Mezzalira, G., 1999	Gli "altri prodotti" degli arboreti da legno. Sherwood - Foreste ed Alberi Oggi, n°51 (11/99).	all	General information about NWFP&S in Italy (species, kind of services)
Minotta, G., 1990	La coltura del noce da frutto ed a duplice attitudine produttiva in collina ed in montagna. Monti e Boschi N.1, 1990, 27 – 33.	Hazel-nut	Production, ecological and technical characteristics
Sansavini, S., 1990	Frutta di bosco e frutticoltura di montagna. Monti e Boschi N.1 1990: 5-13.	Berries	Ecology and techniques of cultivation of different kind of berries
Saporito, L., 2002	Produzione di pinoli in populamenti di *Pinus pinea* L.. Sherwood N. 78 2002, 35 – 39.	Pine nuts	Production and yield
Scrinzi G., Tosi V., Agatea P., Flamminj T., 1995	Gli Italiani e il bosco. Coordinate quali-quantitative dell'utenza turistico-ricreativa delle aree forestali in Italia. Comunicazioni di Ricerca dell'ISAFA 95/1, Trento. 46 pag.	Services	Survey of Italian population and their recreational activities in the forests, detailed information
Zanzucchi, C. 1990	La coltivazione delle piante officinali in collina e montagna. Monti e Boschi N. 1 1990, 45 – 48.	Medical plants	Technical and ecological characteristics of cultivation

Literature:

Croitoru, L., Gatto, P., 2001. Una stima del valore economico totale del bosco in aree mediteranee. Monti e Boschi N.5 2001, 22 – 30.

Farolfi, S., 1990. Ruolo economico deo prodotti secondari spontanei del bosco: un' indagine nel Casentino. Monti e Boschi N.1 1990.

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4.2. Case studies of successful marketing strategies

Case study 1: Truffles

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

In Italy two main kinds of truffles occur: the white truffle (tartufo bianco, *Tuber melanosporum* Vittad.) and the black truffle (tartufo nero, *Tuber melanosporum*). Furthermore there exist some hundred varieties.
Truffles are added to pasta dishes or to liqueurs (black truffles), truffle butter, salami, sauces, olive oil, honey, etc.

The amount of truffles gathered each year was increasing since the war (Figure 1), but truffle production differs between the years mainly for meteorological reasons. In Toscana it varies between 3 000 kg and 33 000 kg (Mazzei, 1998).
In the year 2000 86.5 t of truffles were produced with a value of 18.6 Mio. € (ISTAT, 2003).

Most important regions for truffle production are Umbria, Abruzzo, Marche, Piemonte and Emilia-Romagna.

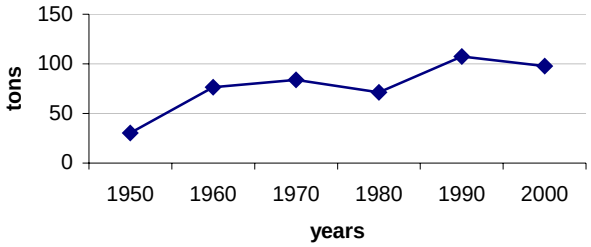

Figure 1: Production of truffles in Italy 1950 – 2000 (ICS, 1951, ISTAT, 1961, ISTAT, 1971, ISTAT, 1982, ISTAT, 1993, ISTAT,2003)

The whole value of the Italian truffle market exceeds 400 000 000 €, where around 500 tons (including imports) are manufactured (Raggi Vivai, 2004, http://www.raggivivai.it/prodotti/tartufo/sottomenu/curiosita.asp).

The real amount of truffles collected each year is likely higher than stated in official statistics since large amounts are sold unofficially. In Alba area (Piemont region) it is expected that a similar amount is sold unofficially (Cesaro *et al*., 1995).

(b) Description of the "product chain" organisation:

Truffles are collected in natural or planted forests for truffle production (*tartufaie*). There are some measures to increase truffle production also in natural truffle forests, like soil protection.

Truffles are revealed with the help of dogs or pigs, and with special instruments they are taken out from the soil. They are cleaned and selected by species, size and quality. For conservation, 2 different methods are possible: 1) vacuum packed with low temperatures (high quality truffles) or 2) sterilized under a temperature of 120 – 130°C.

Usually truffle collectors operate in solidarity. In Toscana, 3100 truffle collectors were registered in 1990; and almost 5000 in 1995 (Marone, Mazzei, 1996). For whole Italy a number of 200 000 truffle collectors was estimated (CIA, 2003).

According to a survey in Toscana region (Marone and Mazzei, 1996) 97% of collectors gather truffles in the province of residence. 16% of collectors were members of associations, 44% were carry on this activity for more than 25 years and have long family traditions. 78% of collectors are male and the average age 50 years (Figure 2).

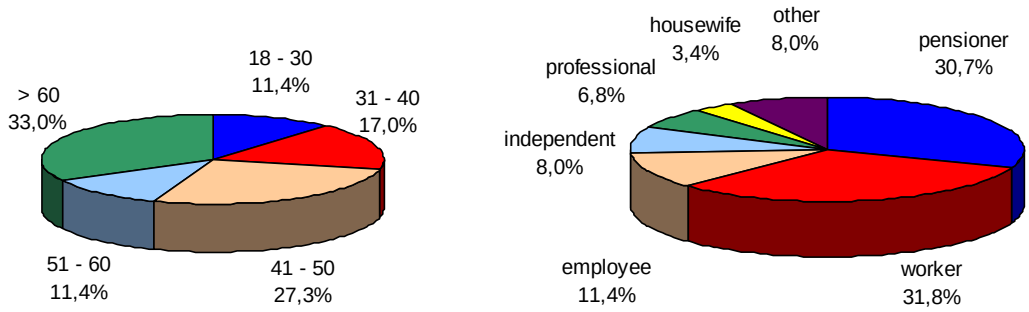

Figure 2: Distribution of age classes and professions of truffle collectors in Toscana (Marone and Mazzei, 1996)

Motivations for gathering truffles are hobby, additional income or entirely income.

The activity is very time consuming. Time consume varies between 28 and 200 days for truffle collecting, with a mean of 4 hours and it differs between natural and cultivated truffle areas (Table 1).

Table 1: Time consume per year [days] (Marone and Mazzei, 1996)

	Average	Maximum
Natural Truffle Areas	64	200
Cultivated Truffle Areas	28	60

The truffle marked is traditional “not transparent” and full of secrets. First of all to keep the secret of the places where truffles are found, secondly to hide the amount, prices and income. Best places to find truffles are passed down from father to son, generation after generation.

Truffle collectors of Toscana region stated that they mainly sale a large amount of truffles to friends and to truffle industry (Figure 3)

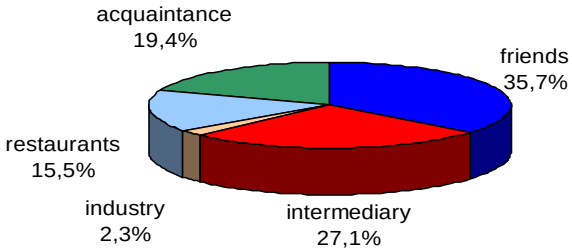

Figure 3: Distribution of end-users of truffles in Toscana (Marone and Mazzei, 1996)

In regions with a long tradition of truffle culture exist every year markets and fairs for truffles where they are sold.

In Italy around 40 middle men are working with one colossus situated in Umbria, who is controlling around 75 % of the world market (Dickinson and Lucas, 1979 in FAO, 2001, http://www.anteprima.net/Ghiottone/appunti/articolo.asp?articolo=17, Figure 4).

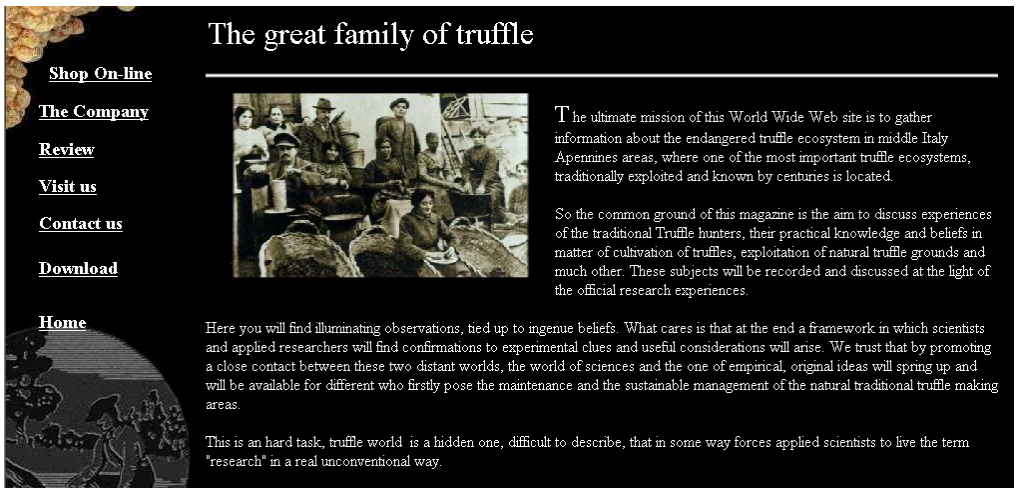

Figure 4: The Urbani's - a case of large (monopolistic) company
(http://www.urbanitartufi.it/principale.asp)

Import/ Export

Italy is together with France and Spain major exporter of black truffles. Exports go mainly to Germany, Switzerland and United States. White truffles are less known and mainly imported by United States, but also from Belgium, France, South Africa and Switzerland. In 1989 United States imported 5.4 t of fresh or chilled truffles, mainly from Italy and France at a value of US$ 1.48 million or US$ 273/kg (Iqbal, 1993 in FAO, 2001).

(c) Policy framework

- Policy institutions involved in the sector and regulations (esp. property rights regulations) that directly influence the NWFP&S production and harvesting.

It exist a national frame law about the collection, cultivation and commercialisation of truffles (Law 752/ 1985).Based on this law Regional Authorities have identified own laws or delegated the responsibility to Provinces or Mountain Communities.

The collection of truffles is free in all non cultivated areas. The law distributes between cultivated and controlled truffle forests, which have to be signed. The Regional Authorities have to confirm cultivated or controlled truffle areas, usually with the help of special consortiums of experts. Controlled truffle forests are natural forests where limited amelioration interventions are allowed meanwhile cultivated truffle forests are new forests planted with mycorrhized trees.

Collectors have to have a licence for truffle collecting, that does not apply to the land owner.

Furthermore the law identifies all details concerning the collection of truffles, like species, collection time, techniques of excavations etc..

Umbria for example has developed rules and regulations that govern the harvesting, cultivation, conservation and marketing of truffles (Regional Law 10/1997). Truffles under managed production are the property of the landowner and are subject to separate regulation. If the somebody else want to manage the forest for truffle production contracts have to be done between the landowner and the truffle collector.

The consortium for recognition of truffle areas has to consist of representatives of Mountain Community, agriculture organization on regional and national level, State Forest Service and association of truffle collectors.

- Policy instruments (incentives, taxation, information, …) available and their role in NWFP&S development

In the official list of certified agricultural products of the Ministry of Agriculture and Forest Policy (Ministero delle Politiche Agricole e Forestali, MiPAF) 24 truffles of different kind or origin are mentioned as traditional products3 (prodotti tradizionali) (http://www.politicheagricole.it/QUALITA/TIPICI/ProdottiTradizionali.asp?Tipo=11).

The National Association of "Towns of Truffles" (Associazione Nazionale "Città del Tartufo") was founded 1990 for promotion of truffles. 19 member towns are organizing together fairs and exhibitions and other festivities around the truffle (http://www.deliciousitaly.com/Piemontedishes1.htm).

Furthermore there exist numerous associations of truffle collectors. The umbrella organization for all of them is the National Federation of Associations of Italian Truffle Collectors (Federazione Nazionale delle Associazioni dei Tartufai Italiani, FNATI), which includes Associations of the regions Piemonte, Lombardia, Friuli Venezia Giulia, Liguria, Emilia Romagna, Toscana, Lazio, Marche, Abruzzo, Molise and Basilicata (http://www.aznet.it/artop/page4.html).

- Role of research, education, and training extension services in NWFP&S development

Main research is concerning cultivation of truffles using mycorrhized planting stock for field plantations and the security of the presence of mycorrhizae in the nursery planting stock. .

The Ministry of Agriculture and Forest Policy has financed a project about the increment of the production of truffles in Italy. Main objects were the verification of methods for mycorrhization of plants, best habitats for cultivations and the foundation of a germoplasma bank of Truffle species (*Tuber spp*.) (http://www.politicheagricole.it/RICERCA/PROGFIN/Tartufo.htm).

[3] The term 'traditional product' intends to certificate a traditional way of processing, conservation and storage of the products (http://www.politicheagricole.it/QUALITA/Glossario.htm).

The Regional Agency for Development and Innovation of the Agricultural – Forestry Sector (*Agenzia Regionale per lo Sviluppo e l'Innovazione nel settore Agricolo-forestale, ARSIA*) gives technical assistance and supports research on the truffle sector. The National Research Centre of Truffles (*Centro Nazionale Studi Tartufo*) organizes courses for truffle controllers (http://www.tuber.it/pagine/corsi/index.php).

(d) Profit appropriation by the landowner/contractor/manufacturer/ dealer/seller

Ther establishment of one hectare of plantation with mycorrized plants (Black truffle) costs 13.000 €/ha (ARSSA, 2000).

The Price of truffles is increasing. At the end of 90's the average price of white truffles in Piedmont region were 1 500 €/ kg (Cesaro et al., 1995). Table 2 shows prices of year 2002 and 2003 of some market centres in Piedmont.

Very high quality white truffles can be sold for 3 000 €/ kg. The price for the final customers is calculated to be between 2 800 and 4 000€/ kg including taxes and distribution costs (Associazione Tartufai del Monferrato di Murisengo, 2003).For black truffles prices of 950 €/ kg were paid this year (Borsa del tartufo, 2004).

Table 2: Prices for white truffles in Piemont region 24th, 26th and 27th November 2003 (Associazione Tartufai del Monferrato di Murisengo, 2003)

Market	Prices [€/ kg]		Price for final customer [€/ kg]	Amount of truffles sold in 3 days[kg]
	2002	November 2003		
Asti	1 300 – 2 200	1 800 - 2 700	2 800 – 4 000	3.4
Moncalvo				1.5
Murisengo				1.5
Alba	1 400 – 2 500			2

The prices of truffles vary not only between the kinds of truffles but also between their origin (Table 3). Highest prices reach truffles from places with old truffle traditions, like the white truffle from Alba in Piemonte. Prices are also increasing within the season (Gregori, 1991).

Table 3: Quantity and value of truffle production in Italy by region 1999 (ISTAT, 2002)

Region	Quantity		Value		
	[tons]	[%]	[1 000 000 €]	[%]	[€/ kg]
Piedmont	2.3	2.7	1.6	8.8	696
Emilia-Romagna	6.0	6.9	1.8	9.6	292
Toscana	5.2	6.0	1.4	7.4	260
Umbria	26.4	30.5	7.5	40.8	282
Marche	10.6	12.3	3.1	17.0	292
Lazio	6.4	7.4	0.7	3.8	109
Abruzzo	18.0	20.8	1.6	8.5	86
Molise	6.3	7.3	0.6	3.0	87
Other	5.3	6.1	0.2	1.1	38
Total	86.5	100.0	18.3	100.0	211

(e) Contractual agreements between landowners and resource managers; networking and joint ventures among/between non-wood processing and service industries

In Toscana region exist an formal agreement between forest owners and association of collectors. No rent is paid, but the forest owners profit from the protection (access limitation) and melioration work done by the collectors.

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

Most important fields of innovation are:

- nursery/ plantation (A certification system of nurseries is necessary to assure mycorrhization.)
- mark of origin (No official trade mark exists for truffles from Italy.)
- distribution (e-commerce)

One example of new commercialisation paths is the on-line Market of the company "Alba Tartufi" (figure 4, http://www.albatartufi.com/).

Figure 4: webpage of online market of the company "Alba Tartufi" (http://www.albatartufi.com/)

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

The history of acknowledgement of truffles in Piemont region goes together with the international acknowledgement of the wine of that region which reinforced tourism too. Today Alba area has one of the highest percentages of agricultural workers and, at the same time, one of the highest average income rates. In addition to the truffle collecting, related activities such as food-processing industries, restaurants and on-farm tourism are all growing rapidly (Cesaro *et al.*, 1995).

In Alba was found the 'Street of White Truffles of Alba in Lower Piermont' (Strada del Tartufo Bianco d'Alba nel Basso Piemonte) to increase the value of the entire region including tourism, culture, environment and gastronomy (http://www.provincia.cuneo.it/turismo/tartufo_bianco.htm, http://www.italnet.it/cgi-bin/informa/articolo?tartufoX.txt+Art-331).

Umbria region tries to attract tourists with truffles to sell wine and other products as well as activities like rafting, cultural events etc. (Figure 5).

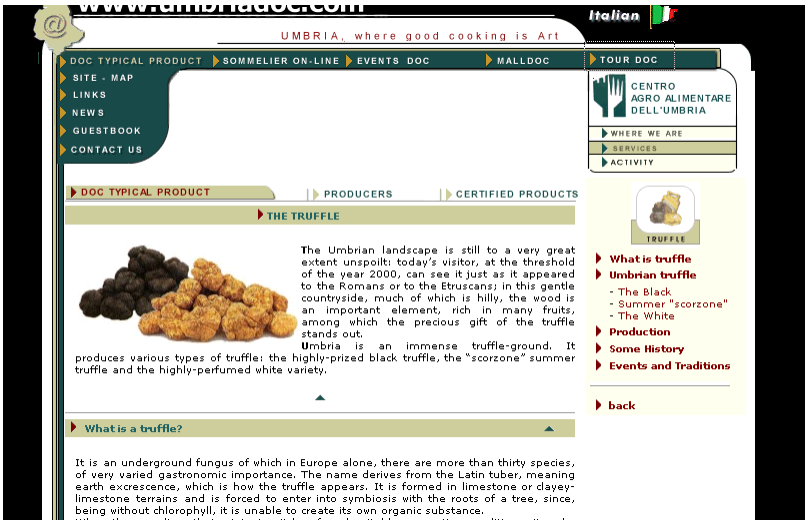

Figure 5: example of territorial marketing in Umbria
(http://www.umbriadoc.com/eng/prodottotipico/generale/prodottotipicodoc_tartufo.htm)

(h) Lessons learns/driving forces/factors affecting competitiveness (SWOT analysis)

On the Italian market appeared in the last years truffles from China which have a less intensive aroma and sold for 50 $/ kg. Acquisition cost is around 3 €/ kg. They are sold mixed with other truffles or even plants are sold with the mycorrhized of that truffle. It is also practised that immature black truffles or Chinese truffles are aromized and sold for a high price.

Competition is arriving also from Eastern Europe, e.g. Yugoslavia, where the same kinds of truffles occur like in Italy (Raggi vivai, 2003, Greenside 2003). Sanctions are urgent, there are initiatives for a new law.

(i) Open questions (barriers to entrepreneurship) and related research needs

(j) Recommandations, proposals for documentation.

web-pages

Institution/ web-page	Information	Region
http://www. truffle.org/	promotion of research on truffle and other ectomycorrhizae	International
http://www.truffel.com/	General information about truffles	Italy
Nursery "Raggi Vivai" http://www.raggivivai.it/	General Information Chinese Truffle, amount and value of truffles in Italy Useful Addresses	Italy
http://www.trovatartufi.com/	Techniques for save truffle production	Italy
Associations of truffle collectors http://www.aznet.it/artop/index.html	National and Regional Associations, Addresses	Italy
National Research Centre of Truffles (*Centro Nazionale Studi Tartufo*) http://www.tuber.it/	Ecology, fairs, courses, literature,	Italy

Regional Agency for Development of Agriculture (*Agenzia Regionale Servizi Sviluppo Agricolo, ARSSA*) http://www.ruralnet.it/	General information about truffles, truffle collection, cultivation of truffles (costs of establishment of tree plantation for truffles), laws	Abruzzo
http://www.langheroero.it/	General Information about truffle collection and commercialization	Piedmont
http://www.mostratartufo.it/	General information about truffles, prices, laws	Piedmont
http://www.provincia.grosseto.it/	Promotion of utilization of truffles	Toscana
Comune di Savigno http://www.comunedisavigno.it/tartufo_sapori.htm	General information about truffle promotion of truffles: national association of "Towns of truffles" (Associazione Nazionale "Città del Tartufo")	Emilia-Romagna
Regional Agency for Development and Innovation of the Agricultural – Forestry Sector (*Agenzia Regionale per lo Sviluppo e l'Innovazione nel settore Agricolo-forestale, ARSIA*) http://www.arsia.toscana.it/	Research about ecological and economic problems Experts about Truffle: G.Nocentini@arsia.toscana.it T.Mazzei@arsia.toscana.it	Toscana

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Case study 2: Chestnut

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

Cultivation of chestnut has a long tradition in Italy. In former times chestnuts were called the "bred of the poor" and around 700 000 t of chestnut were produced each year, 10 times more than nowadays (Bellini, 2003). After the second world war production was still more than 200 000 tons per year (ICS, 1951).

Chestnut production has declined due to two main reasons:
1) urbanisation processes and the drift of population toward the cities, together with the loss of traditional uses;
2) fungal diseases in the 80s and 190es (Chestnut blight - *Cryphonectria parasitica* and phytophthora root rot - *Phythophtora cambivora*) (FAO, 2001).
Nowadays chestnuts become valid as a natural product (Pettenella, 2001).

Italy produced 63 200 t of chestnuts in the year 2000, that amounts approximately to 5% of the world production (ISTAT, 2003 FAO, 2004, Figure 1). Around 50% of production derives from Campania region (ISTAT, 2002, Figure 2).

In Italy 275 000 ha are covered with chestnut forests (75% in the mountain regions, 22% in the hills and 3% in the plain area). 30% of the chestnut forests are in Toscana region. For chestnut fruit production around 209 000 ha are used (Bellini, 2003).
Chestnuts are the most important non wood forest products in Italy from the economic point of view. The value of Italian chestnut production reached 57 million Euro in 2000. The medium price per ton was increasing from 775 € (1999) to 902 € (2000). The variation of the price between the regions is very large, 1999 it ranged from 425 (Calabria) to 2600 (Bolzano) (ISTAT, 2002, ISTAT, 2003)

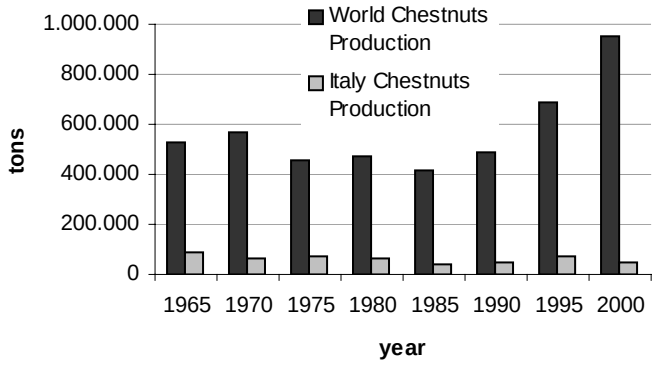

Figure 1: Chestnut production 1965 – 2000 (FAO, 2004)

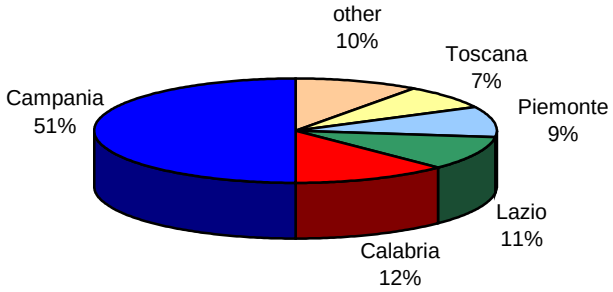

Figure 2: Italian chestnut production by regions (ISTAT, 2002)

In Italy, the term 'chestnut' is used to characterise two types of chestnut fruits: marron (*marroni)* and chestnut (*castagne*). By generalization, a marron is larger and derives when the fruit contains only one nut, when there are more inside, usually 2-3, they are called chestnut (Galie, 2003).

Large amounts of chestnuts are still collected by hands or gathered on tarps. Mechanisation exist in form of special aspirators or tree shakers. Problem of mechanical collection is the destruction of the skin of the chestnuts, which gives the possibility for diffusion of pathogens (fungi).
One worker is able to collect 10-15 kg of chestnut of small sizes per hour and 20 – 25 kg of larger sized fruits per hour (Galie, 2003).
For conservation chestnuts are frozen or dried until the moisture content is reduced by 50-90 % (Galie, 2003).
One hectare of chestnut copse can produce up to 2.5 tons of chestnut fruits per year (Percivale *et al.*, 2003).

(l) Description of the "product chain" organisation:
- number of companies involved and management characteristics (e.g.: family enterprises, joint enterprises, stock companies…,)
- the role and share of SMEs in the product chain (quantity, % of the total harvesting and processing)
- trade activities (import and export flows and development patterns)

In Italy 89 000 agricultural enterprises are producing chestnuts on a surface of 76 000 hectares (ISTAT, 2001).

Production chain varies between chestnuts and marrons (Table 1).

Table 1: Distribution of consumption of chestnuts (Bellini, 2003)

	Chestnut and - Marrons	Marrons
Peeled, for animal feeding and other uses	5 %	< 5 %
Self consumption	5 %	10 - 15 %
Internal markets (fresh consumption)	40 %	20 - 30 %
Processing industry	10 %	35 - 40 %
Dried	10 %	
Export	30 %	15 - 20 %

Products of chestnut industry are dry chestnuts, flower, marrones glaces, chestnuts in alcohol, natural or vacuum packaged as well as peeled chestnuts which continue transformation processes (Bellini, 2003).

Percivale *et al*., 200? give an example of end use distribution in Val di Susa (Piemont region, near Torino) where high quality chestnuts are produced. Since there exist no chestnut processing industry 71 % of the production are exported or processed in other regions of Italy (Figure 3). The association of chestnut producers in the region has created a trademark '*marrone delle valle di Susa*'to guarantee a high product quality.

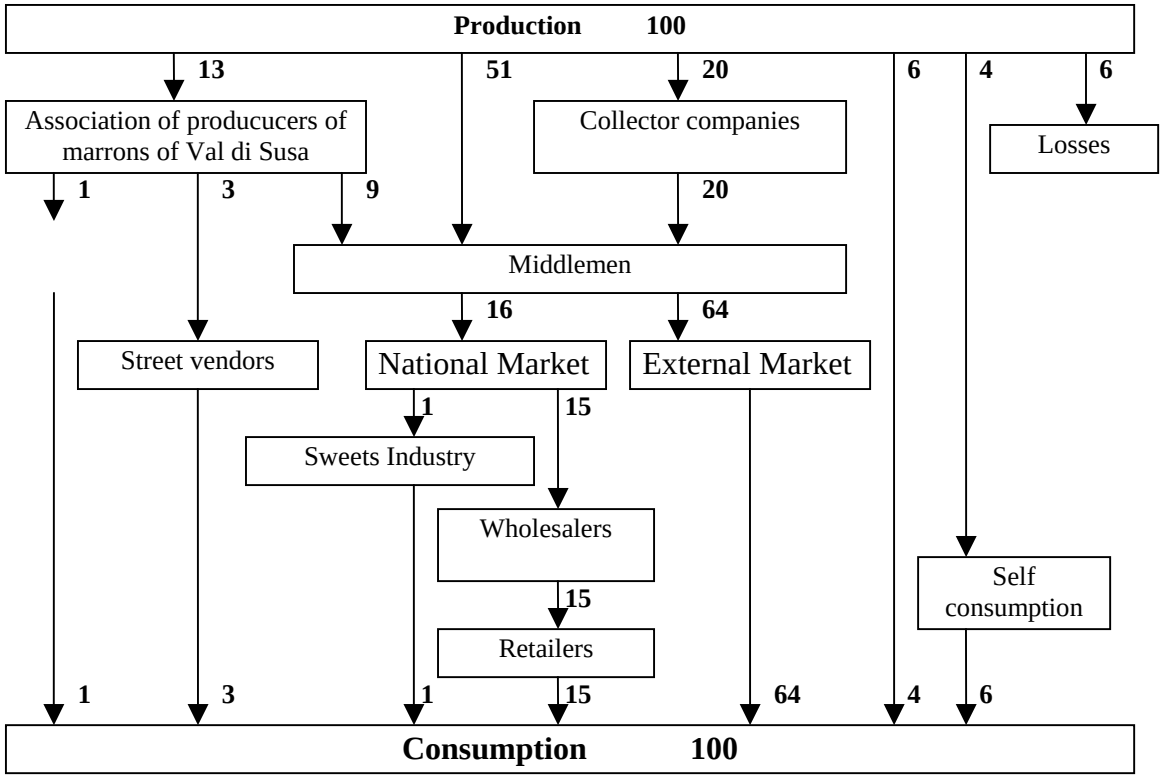

Figure 3: Distribution channels of chestnut production in Val di Susa [%] (Percivale *et al*., 2003)

Around half of Italian exports go to Europe (France, Switzerland and Germany) the other half to America and Asia. The imports are limited (less than 4 000 tons in 1998) (Bellini, 2003)

(m) Policy framework:

- policy institutions involved in the sector and regulations (esp. property rights regulations) that directly influence the NWFP&S production and harvesting
- policy instruments (incentives, taxation, information, …) available and their role in NWFP&S development
- role of research, education, and training extension services in NWFP&S development

There are some incentives for reconstruction of old chestnut orchards and new establishment of chestnut plantation for fruits in Italy to recover the chestnut production especially in protected areas (Parco regionale dei Colli Euganei, 2001; INEA, 2003).
The cost for recovery of chestnut forests for fruit production vary between 6 000 and 9 000 Euro (1998) depending on the region. There are possibilities to get financial support from the regions, for example in Lombardia (L 30/90) and Emilia Romagna (L 30/81) (Maresi, 1998).

Support is also given by the chestnut project within the Leader II – program of European Union. 4 of 11 Local Action Groups (LAG) are from Italy (INEA, 2003) The project includes the following topics:

- Creation of European Street of Chestnuts

- International co-operation between universities and research centres about chestnut diseases and new products
- Networking, creation of a webpage
- European contest of gastronomy
- Publication of a recipe book
- Fair about European chestnut
- Creation of a logo

There exist no law about forest access and collection of chestnuts. As long as the forest owner not prohibits, collection is allowed.
Restrictions (up to 2 kg per person per day) exist in some parks and natural reserves e.g. in the natural park '*Lagoni di Mercurago*' in Piemont region (Consiglio regionale del Piemonte, 1993).

Main research topics are::
- diseases
- cultivation, graft and crown care
- recovering of old chestnut orchards and transformation of chestnut coppice
- acquisition techniques

(n) Profit appropriation by the landowner/contractor/manufacturer/ dealer/seller

Profitability of chestnut production depends highly on the place along the market chain, where the products are sold: forest owners who are able to sell their products on the roadside or at delivery price at the industrial firm yard will normally gain much more from their investments (Pettenella 2001, FAO, 1995)
The collection costs amount to 50% of total cost of the sold chestnuts (Galie, 2003).

(o) Contractual agreements between landowners and resource managers; networking and joint ventures among/between non-wood processing and service industries

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

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

Table 2 shows some positive and negative aspects of marketing of chestnuts.

Table 2: Marketing characteristics of chestnut fruits (Pettenella, 2001)

Positive	Negative
- good nutrient values - different final uses - high added value products through processing - easy storage (refrigeration) - various by-products (honey, mushrooms)	- Difficulties in obtaining a nut clean and of homogeneous size - Production variability - Fresh nuts quality maintenance problems - Fungal infection and insect attach to fresh fruits, weevil damage during storage and later - Harvesting costs, high and concentrated labour requirements

For expansion of chestnut markets four instruments playing remarkable role:

- Certification (see table 3)
- Networking and promotion
- New selling systems
- Procurement policy by public authorities

Table 3: Certification schemes applied in the chestnut market (Pettenella, 2001)

Scheme	Examples
Registration of Protected designation of Origin (PDO) and Protected Geographical Indication (PGI) under Council Regulation 2081/92*	Marron from Castel del Rio (PGI), marron from San Zeno (PGI), marron from Mugello (PGI), chestnut from Monte Amiata (PGI), chestnut from Montella (PGI),
Traditional Speciality Guaranteed (TSG) under Council Regulation 2082/92	8 different flour specialities from Tuscany, Calabria and Liguria Regions
Organic productions certification under Council Regulation 2092/91 and under the system of the International Federation of Organic Agriculture Movements (IFOAM)	Marron from Mugello-Fano Garfagnana

* http://europa.eu.int/comm/agriculture/qual/en/prod_en.htm

Numerous associations and consortiums operate with the aim to increase the value of chestnut fruits and timber, e.g. Provincial Association of Chestnut Cultivation in Brescia *(Associazione Provinciale Castanicoltori Bresciani, ASPROCARB).*

Mountain Communities of Toscana and Emilia Romagna regions have set up the *Associazione Nazionale Città del Castagno* (National Association of "Towns of Chestnut"). The foundation keeps on a range of activities, like creation of a web page and newsletter, are present at trade fairs and fests of festa della castagna (local fests devoted chestnuts , they support research e.g. in form of scholarships for theses, they give technical assistance in aspects of production of chestnut etc.. Furthermore a museum and a "street of chestnuts" with nature trails for tourists are included in their activities (http://proxy.racine.ra.it/cittadelcastagno/home2.html).

Similar activities exist in other parts of the country.

In Valgerola (Lombardia) a project was funded with the aim to increase the value of chestnut in the region. Main objectives were to increase production of chestnuts through cropping techniques improvements, promotion with advertisment for tourism, organisations of trade fairs and fests and delevopment of local rural economies. Project partners were all groups along the production chain, from producers and collectors to a working group for commercialisation (http://www.museovanseraf.com/progetto.htm).

In some regions and towns advertisement for tourism includes chestnuts as a specialty beside nature and cultural highlights, e.g. Sassetta (Toscana) (http://www.greenholiday.it/le_regioni/toscana/citta_e_paesi/paesi/sassetta.asp).

New distribution techniques are developing. For example the *Associazione per la* Valorizzazione *della Castagna*) has created a web-page with on-line shop for typical chestnut products (http://www.marrone.net/).

(r) Lessons learns/driving forces/factors affecting competitiveness (SWOT analysis)

(s) Open questions (barriers to entrepreneurship) and related research needs, Recommendations, proposals for documentation. Information:

Information is available mostly from the northern regions, meanwhile around 75% of production comes from the south of Italy.

Web-pages

Provincial Association of Chestnut Cultivation in Brescia. *(Associazione Provinciale Castanicoltori Bresciani, ASPROCARB)*	Lombardia	General information about biology and utilisation of chestnut	www.infobrescia.it/asprocab
Association of protection of Marrons from Castione *(Associazione Tutela Marroni di Castione)*	Trento	Fair cultivation, techniques, general information	http://www.marronicastione.it/
National Association of "Towns of Chestnut" *(Associazione Nazionale Città del Castagno)*	Italy	Biological and technical aspects of production, commercialisation, producers (in construction), members of association	http://proxy.racine.ra.it/cittadelcastagno/index.html
Association for valorisation of chestnut (*Associazione per la Valorizzazione della Castagna)*	Italy	Recovering of chestnut cultivation fair	www.marrone.net/
Ministry of Agriculture an Forest Policies (*Ministero delle Politiche Agricole e Forestali, MiPAF*)	Italy	Certification of Products	http://www.politicheagricole.it/
National Institute of Agricultural Economics *(Istituto Nazionale di Economia Agraria, I.N.E.A.)*	Italy	Actual problems Leader II Program	http://www.inea.it/
Mountain Community Modena Est *(Comunità Montana Appennino Modena Est)*	Emilia-Romagna	Production of chestnuts and their role on Emilia Romagna, ecology and cultural aspects	http://www.regione.emilia-romagna.it/modena-est/
Projects for valorization of chestnut	Italy/ Europe	chestnut project of the Leader II program research, project examples	http://www.castanea.net/
Institute for Forest Pathology *(Istituto di Patologia degli Alberi Forestali, IPAF)*	Piemonte	Technical and ecological problems of reconstruction of chestnut forests for fruit production	www.ipla.org/

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5. Forests and ownership

5.1. State of the art and historical development

Italian forests are mainly concentrated in mountain areas, as showed in figure 1. Accordingly with CORINE Land Cover statistical data, the total forested area in Italy is about 9.7 Mha), which include forests and other forest vegetation categories such as bushed areas, moors, grasses and abandoned lands under a process of natural colonization by trees, etc. Of the total area, about 8.4 Mha are in mountainous and hilly areas and only 1.3 Million in plain. Accordingly with other statistical data (MIPAF, FAO), the forests in Italy cover about 10.8 Mha.

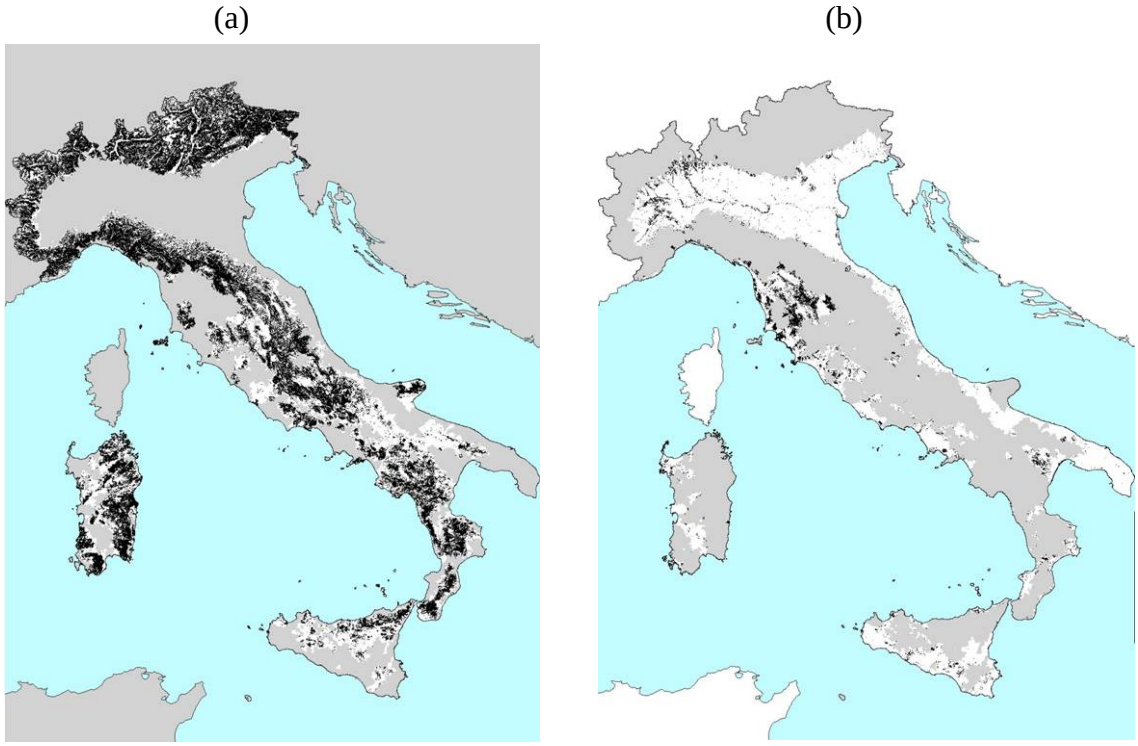

Figure 1 – Italian forests in mountainous and hilly areas (a) and in plain territories (b). Mountain and hilly areas are presented with grey color.

In the last five decades a remarkable expansion of forest cover has be recorded in mountainous and hilly territories: making reference to the data of the Italiy's Institute of Statistics, the forest area with dense tree cover is increased from 5.1 Mha in the late '40s to 6.3 in 2002 (+1.2 Mha); about 2-3 Mha are now under a process of natural conversion to forests. This is mainly due to the process of emigration of rural population from the marginal mountain areas to cities, with the associated abandonment of meadows, pastures and cultivated lands and their progressive colonization by shrubs and trees.

In the same period in the plains areas the expansion of the forests has been of less than 50.000 ha. The current forest cover rate in plain lands is 2.1%; it has grown only of 0.1% with respect to 1970 and 0.3% with respect to 1950. In this case, the main limiting factors have been the demand for intensive farming in the highly productive flat areas and the demand for land due to the process of infrastructure development. In the last 50 years the tree canopy cover (forest areas and hedges) in plains, destroyed in the past by the development of the agriculture sector, has been only partially recovered.

5.2. Forest resources

As already mentioned, two main sources of information on the forest cover structure and distribution are available in Italy:

- the National Forest Inventory carried out in 1985-86 that adopted a broad definition of forest land including land covered by shrubs and scattered trees (total forest land extension is 8.6 Mha);
- the National Institute of Statistics publishing annual data on forest land extension (the most recent data is of 6.7 Mha) including only the forestland within non-abandoned public and private farms.

Making reference to more detailed source of information (the National Forest Inventory) forests in Italy extend over 8,675,100 ha, corresponding to 29% of the total land area. High forests make about 25% of this surface, coppices more than 40%. The remaining 35% are both "*specialised production forests*" (i.e., plantations for timber or wood paste production, tree farming, or non timber products woods: cork, chestnuts, etc.) and "*other forests*" such as scrubs, maquis, rocky or riparian woods, all rarely managed (table 1).

Most of the species present are native or spontaneous; the few exotic ones are generally used for industrial forestry ("special forest crops" category).

Table 1 - Forestland categories and their extension

Category	*surface (ha)*	*%*	*type*	*surface (ha)*	*%*
high forests	2178900	25.1	even-aged	1176300	54.0
			uneven-aged	554400	25.4
			irregular	377100	17.3
			transitory (in conversion)	71100	3.3
coppice forests	3673800	42.3	simple	2751300	74.9
			with standards	922500	25.1
specialised production Forests	288900	3.3	timber	134100	46.4
			non-timber products	154800	53.6
other forests	2160900	24.9	rocky	575100	26.6
			riparian	110700	5.1
			shrubs	1475100	68.3
non-wooded inclusions	372600	4.3			
Total	**8675100**	**100.0**			

Source: ISAFA, 1985.

In high forests, conifers are dominant, both for extension (56.3%) and timber volume (63.1%). The most important species is Norway Spruce (*Picea abies* Karst); also

mountain Pines (*Pinus sylvestris* L., *Pinus nigra* Arnold, *P. laricio* Poiret) and European larch (*Larix decidua* Mill.) are well widespread. Most coniferous forests are located in the Alps (montane and subalpine Spruce, Fir, Larch forests), but some important ones can be found also in the Southern Apennines (*Pinus laricio* Poiret). Broadleaved high forests are mostly beech woods (*Fagus sylvatica* L.), but also oak woods (especially *Quercus cerris* L.)

The national wood volume of high forests is about 405 millions of m^3 (about 211 m^3 ha^{-1}), with a total annual increment of 15.127.900 m^3 (on average 7.9 m^3 ha^{-1} yr^{-1}). Including only the trees with d.b.h. >17.5 cm, the total growing stock lowers to 341 millions of m^3 and the current annual increment is 5.1 m^3. Among spontaneous species, Spruce and Beech have the greater averaged increments (9.4 m^3 ha^{-1} yr^{-1} and 8.5 m^3 ha^{-1} yr^{-1} respectively).

Currently, the annual yield in high forests rarely exceeds 50% of the annual growth and harvesting, on average, is 35% of the current increment. This led to a general increase of the growing stocks in the last decades.

In the part of Italy (mainly in northern regions) where forestry practices have a high standard the silvicultural systems in use nowadays are based on the principles of a sustainable, "near-to-nature" forestry. Forest operations are carefully controlled and restricted, aiming both to timber production and to forest natural regeneration.

Clearcutting is forbidden by law in about 95% of the high-forests, which are subjected to restricted use, in order to enforce soil and water conservation.

Currently the most common silvicultural systems applied in alpine high forests (especially in coniferous forests) are *selection system* and *shelterwood system* (mainly group, stripe or edge systems). This kind of treatments has determined the shifting of many even-aged forests (developed from past clearcutting or afforestation) to uneven-aged or irregular forests. In Beech high forests the most common practice is the *uniform system*. The opening of gaps or stripes by clearcutting is allowed only in stands composed by light-demanding species (larch and pines), in order to meet the ecological requirements of these species and guarantee the stand natural regeneration.

Coppice is largely widespread, especially with private owners. The most common system is clearcut, but for many species the law prescribes to leave some standards to favour seed production and sprouts regeneration in old stumps. The selection system is applied in many beech coppices, a lot of which are of public property (often mountain municipalities).

Coppice with standards is a practice used sometimes only in some areas of central Italy for pure or mixed oak stands.

Although still common in Italy, coppice is currently considered an outdated silvicultural system. The reasons are that its products are largely surrogated by other manufactured items and especially it doesn’t guarantee, as well as high forests, the multiple functions that public opinion expect from forests (soil-erosion control, landscape amenity and recreation).

More and more old coppiced stands in Italy are subjected to conversion operations leading to high forest. Generally conversion begins with thinnings in coppices that are

by large older than their usual rotation age. When stems are relatively old, soil has improved and seed production is abundant the shelterwood system can then be adopted.

Another important aim of Italian forestry is to foster natural diversity and evolution in forests; therefore mixed forests are promoted and the spontaneous recolonization of broadleaved species in coniferous plantations is today strongly encouraged.

5.3. Forest ownership

The distribution of forest types by categories of ownership and management regime is presented in table 2.

Table 2 - Italian forests by categories of ownership and management regime (1000 ha)

	State and Regions	*Communes*	*other public*	*private*	*total*
high forest	198	1019	193	1379	2789
• coniferous	111	636	103	588	1438
• broad-leaved	87	383	90	791	1351
▪ (of which poplar)	4	4	5	105	118
Coppice	148	600	167	1932	2847
coppice with standards	30	157	32	548	767
Total	**376**	**1776**	**392**	**3859**	**6403**

In the following box more recent data on forest ownership structure are presented (data refer to the land with an active managers and not to the entire Italian forest land).

Data on Italian forest enterprises (Agricultural Census 2000):

- No. of enterprises with semi-natural forests = 605,222
- No. of enterprises with plantations = 54,672
- Total = 659,894 enterprises with some forest land

- Semi-natural forests within active farms = 4,548,158 ha
- Land use for plantations in active farms = 162,652 ha
- Total forest land = 4,710,810 ha

- No. enterpriese with >100 ha of forestland (semi-natural forests) = 6,648
- No. enterpriese with >100 ha of plantations = 1,103
- Total no. of forest enterprises with >100 ha = 7,751 (= 25.4% of the total number of enterprises in Italy = 2,593,090)

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

Research questions related to factors affecting enterprise's competitiveness are the following ones:

- Landownership structure and management responsabilities: size of forest holdings, social structure of the forest owner, management objectives (profit v. other obiectives);

- Benefit appropriation and obstacles to internalisation (e.g. legal frame, public opposition);
- Marketing aspects: horizontal integration “product chain” networking, contractual agreements between landowners and resource managers, “territorial” marketing (forest as part of services and products offered by a local community);
- Role of ex ternal assistance (consultants, contractors, venture capital,…).