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Research Notes

**ISSUES AFFECTING ENTERPRISE DEVELOPMENT
IN THE FOREST SECTOR IN EUROPE**

Anssi Niskanen (ed.)

JOENSUUN YLIOPISTO METSÄTIETEELLINEN TIEDEKUNTA

UNIVERSITY OF JOENSUU FACULTY OF FORESTRY

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University of Joensuu
Faculty of Forestry
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FOREWORD

The COST Action E30 entitled 'Economic integration of urban consumers' demand and rural forestry production' was implemented between September 2002 and September 2006. Altogether 21 European countries participated in this work, including Austria, Bulgaria, Croatia, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, the Netherlands, Norway, Poland, Portugal, Romania, Sweden, Switzerland and United Kingdom.

The main objective of the Action was to gain a better understanding of problems and possible solutions to forest-based entrepreneurship in small-scale forestry, wood processing and non-wood forest products and services aiming at improved employment and income in rural areas. The Action had three working groups (WGs):

- 1 WG 1 on *small-scale forestry*, led by Professor Bill Slee (United Kingdom) and Dr Laura Bouriaud (Romania)
- 2 WG 2 on *wood processing industries*, led by Professor Anders Lunnan (Norway) and Professor Pekka Ollonqvist (Finland)
- 3 WG3 on *non-wood forest products and services*, led by Professor Davide Pettenella (Italy) and Professor Udo Mantau (Germany)

Under these working groups, the Action focused especially on three key questions:

- 1 What are the factors affecting the competitiveness of forest – wood / non-wood / services – consumer chain?
- 2 What are the main barriers and prospects of entrepreneurship?
- 3 What problems and opportunities do exist for enterprise development?

The Action was implemented in two phases. In the first phase harmonised information on state-of-the-art in the field of the Action working groups and the Action research questions were collected. These country studies were published in: Jáger, L. (ed.). 2005. Forest sector entrepreneurship in Europe: Country studies. *Acta Silvatica & Lignaria Hungarica*. Special Edition. 811 p.

The country studies and experiences of participating researchers were used to determine the key issues for in-depth analysis in the second phase of the Action. The results of these analyses were presented in the Action workshop at the University of Tuscia, Viterbo, Italy on 13–15 January 2006 and they are also published in this report.

The interest of key scientists to work without any financial compensation on the questions related to forest sector entrepreneurship in Europe made this report

possible. Other significant contributors to this report were the COST Office (Mr Arne Been, Scientific Officer and Mr Nic Standaert, Administrative Officer) and the University of Tuscia (Professor Lorenzo Venzi). Ms Saija Miina (the University of Joensuu) made the layout of the report. I wish to thank all who have contributed in the preparation of this report.

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I Small-scale forestry

SMALL-SCALE FORESTRY PRODUCTION TO SUPPORT THE DEVELOPMENT OF LOCAL WOOD AND NON-WOOD PROCESSING INDUSTRIES

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1. INTRODUCTION

Working group one (WG1) of COST Action E30 was tasked with analysing the conditions under which small-scale forestry and wood supply can meet the demands of locally based wood and non-wood processing industries. Specifically it was asked to undertake the following tasks:

- Analyses of woodlot owners' attitudes on forestry and forest utilisation and current small scale forest practices
- Analyses of practical restrictions and problems in small-scale forestry to support local wood and non-wood processing
- Evaluation of the potential solutions and formulation of practical recommendations on how small-scale forestry can be developed and better integrated into local wood and non-wood processing

In practice, the work of WG1 focused on two main themes. First, it was recognised that a better understanding of forest owners' attitudes and values was needed. Although a number of disparate studies had been undertaken, there was little comparability of national level studies from country to country, and the broad categories of values and attitudes were thought to be rather similar.

In addition two other contributions were made to WG1. First, an analysis was undertaken of the influence of ownership and property rights on enterprise development (Bouriaud 2006). Second, a contextual summary of demand changes was made (Mitchell Banks 2006).

In an exploration of the means to overcome the obstacles of small-scale forest ownership, it rapidly became apparent that there were enormous variations from country to country in the institutional structures to support non-industrial private forestry. Forest owners associations (FOAs) provide an important structure in some countries and are wholly absent in others. These FOAs provided the principal means of overcoming the obstacles to wood processing, though they are likely to be less important in the more individualistic non-commodity based actions relating to non-wood processing activities.

In the context of COST E30 'small-scale forestry' is considered as synonymous with non-industrial private forestry. As a category, non-industrial private forestry normally excludes all public sector forest, all industrial forests owned or leased by processors and all forests held by charitable organisations and NGOs. 'Small' is less an objective category and more a set of culturally conditioned perceptions, in that a ten hectare forest holding in Hungary might be deemed large by local standards and small if viewed through Nordic eyes.

The supporting papers of this action use the term 'forest-based entrepreneurship' as a key term. It is implied that through a more entrepreneurial approach to small-scale forestry and its associated supply chains, new sustainable rural development opportunities will arise. This assertion is not contested here, other than to observe that some types of forestry behaviour, especially the productivist management of forests, almost as a way of life, may represent the antithesis of entrepreneurship, and more a form of ritualistic behaviour associated with the particular identity of being a private forest owner. Equally, the restitution of the right of ownership in Eastern Europe may be of enormous symbolic importance but little commercial value to many new forest owners, although the obvious capacity of forests to support subsistence needs, particularly related to energy, should not be underestimated.

2. DEMAND FOR FOREST PRODUCTS IN EUROPE

Ultimately, the scope for entrepreneurial development in the small-scale forest sector is conditioned by the demand conditions for forest products. In general, growth in the demand in western European markets for wood-based products has been strong in the last few years, after a slackening of demand in the early 2000s. However, the open-ness of timber markets and the commodity nature of many wood products is often associated with long-distance movement of wood products both before and after processing. Strong demand in one nation may not necessarily be associated with increased exploitation of small-scale forestry, though at the margin, a rise in the price of wood products should be associated with an increase in activity.

Six principal drivers of demand can be identified.

- Population
- Income
- Forest accessibility
- Environmental factors

- Societal demands and changes in human needs
- Changes in industrial demand for forest products

Several of these demand drivers impact more beneficially on the demand for non-timber forest products than on timber products, potentially creating a tension between a more entrepreneurially focussed wood sector and a more public good oriented non-wood sector. However, great caution should be exercised in any simplistic assertion of a relationship between entrepreneurial activity in one sector and public good delivery in the other (Mantau 2001).

Wood energy markets are of particular interest as hydrocarbon prices have been raised by increased global demand and political uncertainties in major sources of supply. However, data in this sector is notoriously unreliable. The demand for wood energy has the potential to impact significantly on small-scale forestry, if appropriate supply chains can be developed to move the resource to where it can be transformed into heat energy.

Demand conditions are also strongly framed by relative values of currencies. A strong pound favours imports of wood products rather than domestic production and processing, although strong demand has also impacted modestly on volumes exploited.

3. OWNERSHIP AND PROPERTY RIGHTS

Small-scale forestry is associated with high cost of enforcement of property rights. This is especially the case where the forest is at a distance from the residence of the owner and pilfering of both wood and non-wood products is widespread. The issue of small scale of ownership is often compounded by asymmetric information problems, whereby sellers do not know the value of the product. In addition, the demands on forests for berries, fungi etc are often associated with problems of common pool resources, as are the more recently articulated values associated with carbon storage, biodiversity and informal recreation.

A variety of means can be used to address these problems. Regulatory and incentive means can be used as well as the enhanced enforcement of property rights. Co-operative management can address some of the problems of small scale, and certainly has capacity to reduce information asymmetry problems.

4. SMALL-SCALE FORESTRY CHARACTERISTICS IN THE CONTEXT OF RURAL DEVELOPMENT

This section highlights some cross-cutting themes. These include recognition of the range of theoretical positions on rural development, of the multifunctionality of forest resources, of the diversity of the situation in different countries, of the considerable economic pressures on both small-scale forestry and small and medium sized enterprises (SMEs), of the marketability (or non-marketability) of forest services and of the diverse range of actions that have been attempted to revitalise local wood supply chains.

In developed western countries, the growing interest in *rural development* has come about largely as a result of the recognition that, at the same time as major declines in employment in the primary sector, and an associated diminution in its contribution to national and regional gross domestic product (GDP), rural areas have not all declined. Many have argued that a more holistic conception of rural economic activity is needed to capture a growing range of activities taking place in rural areas, some explicitly connected to the land resource base, some indirectly connected and others almost entirely disconnected.

This growing interest in the changes taking place in rural areas might have begun in something of a theoretical void, but a substantial amount of theoretical discussion has taken place more recently which might inform perspectives on the connections between non-industrial private forestry and sustainable rural development. Amongst studies that have tried to take stock of these theoretical developments, Terluin's (2003) work is often cited. She has identified four main groups of theories (Table 1).

Table 1. Four groups of theory concerning rural development (Terluin 2003).

| | Production function | Theories |
|-------------------------------|----------------------------|---|
| Traditional models | (economic) $Y = f(L, K)$ | Neoclassical growth theory Keynsian approaches |
| Pure agglomeration models | $Y = f(AE, L, K)$ | Cumulative causation theory Growth pole theory New economic geographies theories |
| Local Milieu models | $Y = f(LM, L, K)$ | Endogenous growth models |
| Territorial innovation models | $Y = f(I, M, L, K)$ | Incubator theories Innovative milieu Porters theory of competitive advantage etc. |

It is not our purpose here to compare the relative merits of these different theories or indeed to critique the classification offered. Instead, we acknowledge that the window through which we view the economic problems faced by the small-scale forest sector is likely to be coloured by the theoretical perspective taken. Further it is almost impossible to view changes in the forest sector without acknowledging the much-debated and contentious quasi-theoretical descriptors of rural change, such as the shift from productivist to post-productivist rural space, the emergence of an ecological modernisation paradigm and the more prosaic assertion of a forestry transition, a point at which the processes of deforestation are reversed by new social, economic and political forces. The theoretical vantage point taken may suggest a need to focus on supply chain innovation or the enhanced delivery of ecological services. We must also be alert to the extent to which the focus for inquiry is necessarily connected to discernible theoretical roots, even if those connections are not always formally acknowledged.

The so-called 'European model of agriculture' with its core characteristic of *multifunctionality* is paralleled by the situation in the forest sector. Indeed, it might be argued that multifunctionality or in forestry parlance 'multi-purpose forestry' has an even longer history in the policy forum. As in agriculture so in forestry, the delivery of environmental services has become a more important part of that multifunctionality in recent decades. Because of the public good character of many environmental goods and services, the private forest owners' room for manoeuvre to develop new commercial opportunities may be circumscribed to ensure delivery of these public goods, with or without compensation.

There is great *diversity* of non-industrial private forest (NIPF) in Europe. At European level there are in the region of 15 million small-scale forestry holdings covering in excess of 37 million hectares of land in the European Union and applicant states. The average size of holding varies enormously from region to region, with forest holdings of 100 hectares quite common in some parts of northern and Western Europe but less frequent in Central Europe and almost wholly absent in Eastern Europe. The prefix 'small' is thus almost always appropriate in studies of private forestry in southern or Eastern Europe but perhaps less appropriate in the north and west. The overwhelming majority of small-scale forest owners in all parts of Europe are pluriactive, with few NIPF owners wholly dependent on forests for their well-being.

The diversity of response to this heterogeneous structure of ownership of forest is partly framed by market conditions but it is also strongly influenced by the motivations and interests of the forest owner. Neighbouring woodlands can abut each other but be operated under wholly different management regimes, one based on active silviculture and the other experiencing total neglect. This suggests that something other than market opportunities mediates the degree and style of woodland management.

There is no doubting the *economic challenges* under which the European forest sector operates. In general, the small size of European private forests militates against their economic viability in a world in which globalised forest processing firms add value to large volumes of wood raw material. Many forests are managed as part-time enterprises and create insufficient income to support a household. However, in some parts of south-eastern Europe, forests provide an important subsistence function, particularly with regard to woodfuel, but also in relation to food.

The greatest challenges to small-scale forestry arise in the search for cost-effective strategies for forest harvesting on small woodlots. The cost advantage of harvester-based felling is considerable. Motor manual felling is relatively expensive and unless the opportunity cost of own labour is very low, the viability of motor manual felling on small woodlots is compromised.

However, the small-scale forest owner may not be treating his/her woodland as an income-generating asset. The ownership of the woodland may be more important as symbolic capital than as a source of income. The retention of ownership of small-scale forests by family members living at a distance from the forest reinforces the notion of the forest as a source of symbolic capital rather than as income generator and also raises questions about how effective arm's length management can be ensured at a distance.

One of the inevitable consequences of moving from market-based timber outputs to increased demand for environmental and recreational goods and services is the quasi *public goods* status of so many of the new service demands on forests. Working groups two and three of the COST Action E30 consider these opportunities further, recognising that marketability is very much a function of the disposition of property rights.

On superficial examination, the forest sector occupies a contrasting position to the farm sector, in that it is lightly subsidised, at least in terms of market subsidies. This gives forestry a relatively clean bill of health from a World Trade Organisation

perspective. However, a highly variable raft of *policy measures* exists from country to country which to differing degrees in different places offers incentives to new planting (mostly on farmland), to forest management, to public good delivery and the private sector forest owner now operates in a significantly regulated policy environment.

5. TWO PERSPECTIVES ON THE CHALLENGES OF ENGENDERING ENTREPRENEURSHIP IN THE NIPF SECTOR

5.1. Goals and attitudes of private forest owners

The attitudes and values of forest owners were the explicit object of interest of one of the sub-groups of WG1 in COST Action E30. The attitudes and values of private woodland owners have been investigated in a number of studies. Although economic motivations are often cited as an influence on management behaviour, entrepreneurial attitudes are not normally separated out and, with the exception of one Norwegian study, the relationship between attitudes and entrepreneurship must be inferred rather than elicited.

The purpose of typologies is usually to group individuals into similar classes. In the case of typologies of forest owners' attitudes, one might anticipate that armed with the results of such studies, it would be possible to make inferences about forest-related decision making. However, it is rare to find an explicit connection.

A number of possible typologies can be suggested. The different studies in a number of developed countries and some rather less countries with economies in transition indicate broadly similar groupings of attitudes though the inferences regarding the supply of wood into the wood supply chain are by no means straightforward.

There is a group of owners who have economic attitudes towards their forest and woodland. For some the income derived from the woodland is an important contributor to their economic well-being. However, this economic motivation can manifest itself in at least three ways. First, there is what might be termed a *formal* economic goal: a desire to extract economic benefit from forest production. Second, there is a goal of some forest owners described by Lönnstedt (1997) as '*informal*' and economic. This appears to differ from the formal goal in that it relates to NWPF rather than timber. A third group of economically motivated goals relates to the use of forestry as a *secure investment*. The goal thus relates to investment rather than to profit and it may be motivated by the desire for security rather than profit.

Those regarded as having economic goals are described in some of the North American literature as 'timber agriculturalists' (Kurtz and Lewis 1981). These are

business-oriented farmers who are essentially treating trees as a farm enterprise. It might be expected that many traditional European forest farmers might be described as having similar goals. In post-socialist countries such as Lithuania (Mizaraitė and Mizaras 2005), one type of new forest owner is classified as the forest businessman, who is explicitly viewing the forest as an income-generating investment.

Lönnstedt (1997) distinguishes between what he terms economic goals and *production* goals. Other Swedish studies have also identified this type of forest owner motivation, based on the desire to manage a productive stock of timber. Many farming studies have identified similar goals, which although often giving an appearance of being motivated by financial or economic motive are actually motivated by the desire to be identified as a good forester or good farmer.

A second major grouping of aims and motives of forest owners relate to their preference to use the forest as a place for *consumption-based activity*. Some forest owners 'consume' the wood and non-wood products for personal use. Timber can be especially important as a source of fuel, but in addition a range of other products to support subsistence can be harvested/extracted from the forest.

A section type of consumption-related forest owner is the forest *environmentalist*, whose interests and aims often relate to wildlife conservation. Others label this group of forest owners 'ecologists'. This might be thought of as a subgroup of consumption motives. Some of this broad grouping may be more interested in landscape and the aesthetic aspects of the forest.

A further group of forest owners are identified as having *intangible goals*. The associated values of forest owners vary from author to author but it is clear that among some social goals are of importance whereas for other the social goals are linked to leisure pursuits such as hunting.

Many forest owners do not have single goals for their forest. They are motivated by a range of factors and their forestry goals may be as broad as their forests are multifunctional.

Another subset of owners is to a high degree *indifferent* about managing their forest resource. Often such forest owners are keen to see the forest retained in family ownership, but are not engaged in active management. They may well live at a distance from the forest resource.

The actual evidence of behaviour suggests that multi-objective forest owners tend to manage their woodlands most intensively. However, paradoxically, the owners most interested in stand improvement, tended to be amenity owners.

The most decisive evidence of entrepreneurial attitudes influencing behaviour is found in Lunnan's (2005) study of Norwegian forest diversifiers. These risk-taking entrepreneurial forest owners were diversifying their forest service offer by developing letting accommodation and hunting and fishing enterprises. This implies a productivist, commodity-producing but largely non-entrepreneurial set of values of many production foresters, who may nonetheless be feeding wood raw material into a much more aggressively entrepreneurial and highly competitive processing sector.

Any conclusions from the work of attitudes and values of forest owners must be couched in caution. It would appear that there is a small proportion of private forest owners that is explicitly entrepreneurial in its forest management practices and business orientation. In some countries, the activities of this group are more related to forest services and in others to conventional forest products. They are probably a minority of forest owners in Europe. Many forest owners do have some economic motivation for owning woodland, but they would bear little resemblance to profit maximising entrepreneurs. Instead they resemble what some economics textbooks (following Simon, 1955) term 'satisficers'. A further significant grouping relates to the use of forests for self-consumption, of timber, fuel, game or amenity products. This category may or not be economically motivated. It is not clear whether an economic calculus is used by the forest owner in considering say the trade-off between own produced woody biomass for fuel and purchases of hydrocarbons.

5.2. Forest owners associations

Another sub-group of WG1 in COST Action E30 explored the role of forest owners associations (FOAs) in creating preconditions for entrepreneurial activity among NIPF owners. Forest owners associations have been established at very different times in different parts of Europe. They have a long history in Nordic countries and Germany and a much more recent history in other countries including post-socialist countries in eastern and central Europe and in Ireland and parts of southern Europe.

Given the recent evolution of FOAs in some areas, there is a case for exploring their evolution and potential functions. Whether or not their evolution is a conscious rational act or a more subconscious and uncertainly motivated emergence of a set of institutions to support forest owners is immaterial. These institutions exist and have a discernible if variable role in supporting non-industrial private forest owners. *Inter alia* such institutions can address;

- Lack of economies of size and scale
- Absentee ownership and the delivery of management and work functions
- Countervailing power in selling forest products
- Certification and regulation
- Management of externalities through internalisation and regulation
- Management of public relations
- Support for innovation
- Rent-seeking behaviour on behalf of forest owners

One of the major challenges facing forest owners associations is the multi-functionality of forests and the enormous diversity of owner motivations and values. If owners are such a broad church as is intimated in studies of forest owners' goals and attitudes, how can FOAs adequately cater for all?

A critical area of action by forest owners associations is the intermediation on behalf of positive and negative externalities. In many parts of Europe the management of unmanaged woodland to reduce risk of forest fires is a major priority. This function for collective action is a direct result of the inability of individuals acting alone to deliver the public benefit of reduced fire risk. FOAs also have the capacity to assist in the delivery of positive externalities. However, if FOAs do no more than act as a lobby on behalf of forest owners there is a danger of free-riding by those who do not subscribe to these organisations.

The preconditions for formation of FOAs are potentially varied. They may arise because of a trigger factor. They may be constituted as arms' length agencies by government as part of a corporatist alliance between state and private sector. Restitution of forest land to former owners and their successors or those with other claims and the search for a just settlement in the partial restitution processes in post-socialist countries seems a plausible rationale for their formation. There are many others. A second rationale is that such institutions can become delivery agents for combinations of public and private goods in ways that incentivise membership. Third, there may be an evolving state of critical mass which, at low levels of membership, delivers few members but as the power of the FOA increases it can engage additional partners in the collective enterprise as the marginal returns to membership rise.

The scope for FOAs to intervene on behalf of their members is considerable. Their firm position in the institutional structures of some European countries is testament to their functional utility. This utility is not only about delivering financial

returns to forest owners, although this may well be a concern for absentee owners who regard the FOA as a sort of low-risk, relatively low-cost consultancy. Instead the FOAs are likely to deliver a range of functions, from knowledge transfer to public good management in addition to what might be termed commercial services and support for forest management to generate wood raw material flow into the wood supply chain. However, their historic mission to ensure a controlled wood supply to industrial processors is now tempered by a range of complex functions, which creates perhaps more scope for dissent and disagreement about their roles and modus operandi.

6. CONCLUSIONS

The focus on WG1 on two facets of private forest owners, their goals and values and the FOAs which have been formed to act on their behalf expose two contrasting perspectives on the challenges of engendering entrepreneurship in the NIPF sector.

On the one hand the study of goals suggests a very wide range of goals with consequences that are not always supportive of greater delivery of wood raw material into the wood supply chain. It seems probable that the heterogeneity of ownership motives is increasing, with, if anything, new owners being more ill-disposed to engage in overtly commercial and entrepreneurial activities in their woodlands. For many owners, the value of the resource resides in the warm glow of ownership and the private amenities that the ownership confers. However, where there are newly restituted forests, there may be greater scope for developing new markets through entrepreneurial actions, not least because of asymmetric information regarding timber markets, distrust of FOAs which are tainted by self interest of managers, and the cash needs of the initially restituted owners.

On the other hand, the case for FOAs seems to be convincingly made where there is a large pool of similarly disposed forest owners and, given flexibility by the FOA, it may be possible for such organisations to cater for a broad range of interests, certainly a range which includes both resident and absentee owners. However, at times it seems that the FOAs may be tainted by a productivist mind-set that was more appropriate a) when farm foresters were more dependent on wood sales for their well-being and b) when reasonable profit was made by the FOA operating on the owners' behalf. The value of a FOA is most apparent when the FOA can negotiate prices and deal with complex assortments of timber, handle regulatory demands and deliver through its or the states forest management guidelines, the desired public goods. It

is also advantageous when the FOA has political clout with the relevant ministries. However, the value of an FOA is determined by situational specificity as well as path dependence. It depends on the forest management challenges of private sector forest owners as well as the history of the FOA and its position of acquired power and mediation in forest management.

Though it is evident that NIPF will survive as a form of forest ownership, there are some uncertainties. The evolving nature of forest owners' goals and values will necessarily change alongside evolving understanding of how NIPF can best contribute to sustainable rural development. If the global crisis predicates carbon storage as a market driven function, it would not be wholly improbable to anticipate a reduction in the felled volume of timber alongside the emergence of a more entrepreneurial approach to the management of forest resources. Whilst the wood supply chain might lose out, society at large might be better off as a result of the public good value of the climate change averted. Further uncertainties emerge through consideration of local energy supply chains based on renewable biomass rather than fossil fuels. The scope for biomass entrepreneurs seems considerable, but such opportunities cannot arise without policy leadership and institution building.

We are at an important point in the development of forests. The demands on forests will almost certainly change and there is a need for creative adaptive institutions and creative forest owners to meet these changing demands. Some will take an entrepreneurial route towards niche products; others will continue to meet the demand for commodity timber in the wood supply chain; others will engage more fully with public goods, the composition of which will vary from place to place. The need for creative and adaptable forest owners and institutions has never been greater.

REFERENCES

- Bouriaud, L., 2006. Ownership and property rights - factors relevant for innovation and enterprise development in small-scale forestry. In: Niskanen, A. (ed.) Issues affecting enterprise development in the forest sector in Europe. University of Joensuu, Faculty of Forestry, Research Notes 169. Pp. 58-70.
- Kurtz, B.W. and Lewis, B.J., 1981. Decision-making framework for non-industrial private forest owners: an application in the Missouri Ozarks. *Journal of Forestry* 79(5):285-288.
- Lunnan, A., Nybakk, E. and Vennesland, B., 2005. Entrepreneurial attitudes and probability for start-ups – an investigation of Norwegian non-industrial private forest owners. *Forest Policy and Economics*. In press.

- Lönnstedt, L., 1997. Non-industrial private forest owners' decision process: A qualitative study about goals, time perspective, opportunities and alternatives. *Scandinavian Journal of Forest Research* 12:302-310.
- Mantau, U., Merlo, M., Sekot, W. and Welcker, B., 2001. **Recreational and environmental markets for forest enterprises**. CABI Publishing. 541 p.
- Mizaraitė, D. and Mizaras, S., 2005. The formation of small-scale forestry in countries with economy in transition: Observations from Lithuania. *Small-scale Forest Economics, Management and Policy* 4(4):437-450.
- Mitchell-Banks P., 2006. Characteristics for European consumer demand for forest products. In: Niskanen, A. (ed.) *Issues affecting enterprise development in the forest sector in Europe*. University of Joensuu, Faculty of Forestry, Research Notes 169. Pp. 22-57.
- Simon, H.A., 1955. A behavioral model of rational choice. *Quarterly Journal of Economics* 69:99-118.
- Terluin, I., 2003. Differences in economic development in rural regions of advanced countries: An overview and critical analysis of theories. *Journal of Rural Studies* 19:327-344.

CHARACTERISTICS OF EUROPEAN CONSUMER DEMAND FOR FOREST PRODUCTS

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SUMMARY

The research focus of this paper is to investigate the **characteristics of European consumer demand for forest products**. Given the growing importance of urbanisation throughout Europe and the central role that governments can play in influencing the market, it is reasonable to argue that consumer demand is influenced by urban residents, government purchasing and infrastructure investment policies, forest industry fibre supply and either the domestic sale or export of timber and timber products.

There are other factors that have to be considered as well, such as: population; income; forest accessibility; environmental factors; societal demands, changes in human needs, biophilia and green health and changes in industrial demand for forest products. This paper provides an overview of how these factors play roles that are both individual and inter-related.

1. MAIN CHARACTERISTICS OF UNECE CONSUMER DEMAND

The UNECE region, has been chosen as it incorporates the European region and its two major markets, the CIS (Commonwealth of Independent States) and North America. Figure 1 indicates that the European forest product market has had a general recovery since its low mark in late 2001, early 2002.

When a more detailed analysis of the constituent regions of the UNECE and their timber and timber product markets is provided (see Table 1), the growth in all three major market segments (sawnwood, wood-based panels, and paper/paperboard is apparent. There are major manufacturing and import/export differences not only between the UNECE regions but also within the regions themselves, particularly in Europe.

Throughout the UNECE region, 2004 saw strong economic growth in the forest sector with record production levels and this is expected to continue in the foreseeable future. This growth occurred despite continued economic weakness in some western

European countries as well ongoing weakness in the CIS countries – albeit at a higher economic level than the pre-1991 transition levels. Europe’s primary wood product exports were more than twice the value of North American exports (United Nations 2005). It is important to realize the importance of the UNECE region relative to total global trade in primary forest products. In 2004, the UNECE region produced 82 % of the world’s industrial roundwood, 73 % of its sawnwood, 63 % of its panels, 66 % of its pulp and paperboard, 77 % of its wood pulp and 67 % of its recovered paper (see Figure 2) and for primary forest products accounts for between 75 % to over 95 % of primary forest exports.

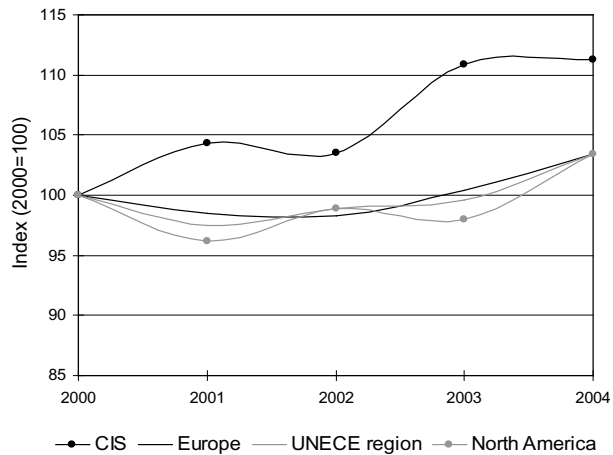


Figure 1. Apparent consumption of forest products in the UNECE region, 2000-2004. Forest products include sawnwood, panels, paper and paperboard. (Source: UNECE/FAO TIMBER database 2005).

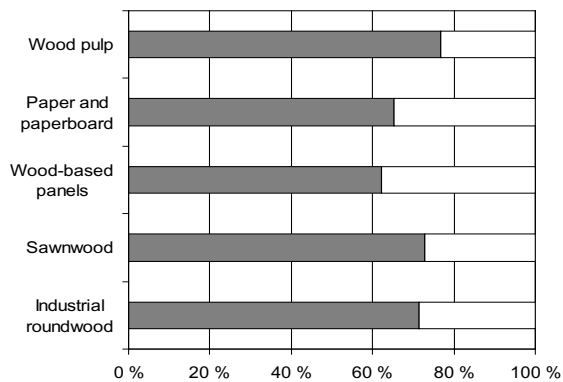


Figure 2. UNECE region’s share of world production of primary forest products, 2004. Note: UNECE region in 2004, world in 2003 (most current statistics). (Sources: UNECE/FAO TIMBER database, FAO statistics, 2005).

Table 1. Apparent consumption of sawnwood¹, wood-based panels² and paper and paperboard in ENECE region, 2000-2004. (Source: UNECE/FAO TIMBER database, 2005).

| | | 1000 | 2000 | 2001 | 2002 | 2003 | 2004 | Change 2003 to 2004 | |
|-----------------------|-------------|------|---------|---------|---------|---------|---------|---------------------|------|
| | | | | | | | | Volume | % |
| Europe | | | | | | | | | |
| Sawnwood | m^3 | | 111378 | 107200 | 107746 | 110746 | 114859 | 4113 | 3.7 |
| Panels | m^3 | | 55552 | 54525 | 54426 | 56694 | 59879 | 3186 | 5.6 |
| Paper and paperboard | <i>m.t.</i> | | 89328 | 89345 | 88884 | 90023 | 91002 | 979 | 1.1 |
| Total | m^3EQ^3 | | 569911 | 561641 | 560792 | 573082 | 588078 | 14996 | 2.6 |
| of which: EU25 | | | | | | | | | |
| Sawnwood | m^3 | | 98084 | 94806 | 93844 | 96525 | 99301 | 2776 | 2.9 |
| Panels | m^3 | | 50023 | 49621 | 48831 | 50128 | 52223 | 2095 | 4.2 |
| Paper and paperboard | <i>m.t.</i> | | 82552 | 82788 | 81772 | 82852 | 83784 | 932 | 1.1 |
| Total | m^3EQ^3 | | 516822 | 511733 | 505487 | 515514 | 526465 | 10951 | 2.1 |
| CIS | | | | | | | | | |
| Sawnwood | m^3 | | 16213 | 15364 | 13226 | 12386 | 11543 | -842 | -6.8 |
| Panels | m^3 | | 5133 | 5998 | 6702 | 8219 | 8265 | 46 | 0.6 |
| Paper and paperboard | <i>m.t.</i> | | 4508 | 5144 | 5698 | 6434 | 6855 | 421 | 6.5 |
| Total | m^3EQ^3 | | 49435 | 51617 | 51201 | 54777 | 54932 | 155 | 0.3 |
| North America | | | | | | | | | |
| Sawnwood | m^3 | | 136083 | 135484 | 144148 | 140129 | 148214 | 8084 | 5.8 |
| Panels | m^3 | | 61947 | 56893 | 60106 | 62192 | 66823 | 4631 | 7.4 |
| Paper and paperboard | <i>m.t.</i> | | 102510 | 97542 | 97401 | 96726 | 101057 | 4331 | 4.5 |
| Total | m^3EQ^3 | | 664358 | 638470 | 656995 | 651616 | 686641 | 35025 | 5.4 |
| UNECE region | | | | | | | | | |
| Sawnwood | m^3 | | 263674 | 258048 | 265120 | 263261 | 274616 | 11354 | 4.3 |
| Panels | m^3 | | 122632 | 117416 | 121234 | 127105 | 134968 | 7863 | 6.2 |
| Paper and paperboard | <i>m.t.</i> | | 196346 | 192031 | 191982 | 193183 | 198914 | 5731 | 3.0 |
| Total | m^3EQ^3 | | 1283704 | 1251729 | 1268988 | 1279475 | 1329651 | 50176 | 3.9 |

Notes: 1 Excluding sleepers, 2 Excluding veneer sheets, 3 Equivalent of wood in the rough. 1 m^3 of sawnwood and wood-based panels = 1.6 m^3 , 1 *m.t.* paper = 3.39 m^3

The following are some of the market drivers for primary forest products in the UNECE region during the period 2004-2005 (ibid):

- A strong US housing market with approximately 2 million housing starts of which 95 % were wood-based construction – and this export market remained strong despite the US dollar's devaluation.
- China imports of temperate timber (primarily sawlogs and veneer logs) from Russia and other CIS countries, but also from the US and Europe.
- While China's domestic consumption has been growing rapidly, their exports of value-added wood and paper products has led to structural readjustment globally, most notably in the US marketplace, such as the furniture sector which has seen over 50 plants shut down and over 14 500 jobs lost.
- A stronger Japanese economy with a million housing starts, of which half are wood-based construction, has also seen an increase in exports of logs and sawnwood, primarily from Russia, but also from outside the UNECE region.
- Rising energy costs have led to increased interest in renewable energy, and the EU Renewable energy policy aims at attaining 12 % renewable energy sources by 2010, and biomass initiatives form an important part of this strategy. Countries such as Sweden are already heavily involved in biomass energy production. The combustion of sustainably produced biomass is carbon neutral, and the additional potential to count the expansion of carbon-sequestering forests for carbon sequestration makes biomass energy particularly attractive.
- The promotion of the sustainable use of wood and paper products has led to strengthening markets.
- Innovation, such as in engineered wood products – driven by market demands – has led to increased consumption of these products and a positive outlook for the sector.
- Purchasing policies of retailers and governments (such as Germany and the UK) have been one of the contributing factors to the growing market for certified wood and timber products.
- The increase of certified forestland by a third to 240 million hectares has also had a profound impact on the supply of certified forest products.

2. SNAPSHOTS OF FOREST PRODUCTS MARKETS IN TEN EUROPEAN COUNTRIES

A series of brief consumption profiles are provided for ten European countries, including Western European and Accession countries that are major producers/and or consumers of timber and timber products. As can quickly be seen, there is a very wide scale and scope to European forestry, experiencing different market demands, with the forest sector playing profoundly different economic, social and environmental roles in each country.

2.1. Austria

Austria has approximately 171 000 forest owners accounting for approximately 47.2 % of the country's area and forest activities play a very important role in farmers' income and to the value-added sector in rural areas.

Raw wood

The intensity of utilisation has been decreasing markedly, with only 60 % of the potential 31.5 million cubic metres of annual increment being harvested. In 2004, approximately 16.5 million cubic metres of timber was harvested, of which 5.55 million cubic metres was damaged wood - roughly a third lower than the previous year's total. There is a demand for high-quality roundwood in response to the large volume of bark-beetle infested timber that has formed a large part of the mill diet as of late (Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management, Forestry Department 2005).

Wood energy

There is a growing demand to utilise biomass supported by the Austrian Climate Strategy and a government programme to promote a 75 % increase by 2010. Austrian forests clearly have the capacity to support the increased biomass demands and there is a recognition that logistical challenges need to be addressed and an increase in forest tending carried out (ibid).

Certified forest products

Since February 2002 all forest regions in Austria, representing a total of 3.9 million hectares have been certified according to the Pan-European Forest Certification (PEFC). Certification in the timber-processing chain and in the timber trade is well advanced, with that of the pulp and paper, fibreboard, chipboard and the large

sawmills largely having been completed. The small and medium-sized enterprises are utilizing a group scheme to allow cost-efficient participation, with approximately 300 timber-processing enterprises participating. Forest Stewardship Council (FSC) has not played a major role in Austrian certification, largely applying only to imported products such as teak garden furniture (ibid).

Value-added wood products

In 2004, the furniture (2.4 billion Euro, +11 %), construction (1.83 billion Euro, +9.6 %) and ski industry (280 million Euro) represent important value-added sectors. The major components of the construction industry were windows, prefabricated wooden houses, doors, floors and glued wooden building components. Interestingly Austria is responsible for about 60 % of the global production of Alpine skis (ibid).

Sawn softwood

Exports increased reflecting expanding Austrian involvement in the Italian and other overseas markets, with total 2004 production representing 2.1 billion Euros (+9 %), with softwood representing the majority (ibid). Fully two thirds of the domestic sawn softwood is exported to Italy, with continued strength in this sector. Another major market is the US, with exports increasing by just over a quarter to approximately 238 000 cubic metres. There remain continued worries about the German market and Japan (representing Austria's fourth biggest market) has had a reduction of approximately 20% (ibid).

Sawn hardwood

Sawn hardwood represents a relatively small sector with 216 000 cubic metres produced in 2004, with 150 000 of this being exported representing a 3 % increase over 2003. Sawn hardwood imports fell by approximately 0.5 % to 215 000 cubic metres (ibid).

Wood-based panels

Chipboard, MDF and fibreboard industries had a 5 % increase in sales to 856 million Euros. This sector accounts for more than 3 000 direct jobs and an additional several thousand indirectly employed people and represents one of Austria's more stable forestry sectors (ibid).

Pulp and paper

In 2004, a record 4.85 million tonnes of paper, cardboard and paperboard was produced, with the export market representing over 85 % of this production. While

timber supplies, water, excellent paper recycling and a well trained workforce all exist in Austria; there are challenges with energy and climate policy constraints. Strategies such as reform of the Eco-electricity Act, supplying timber for biomass energy requirements without creating shortages for the pulp and paper sector, and promoting favourable investment conditions for co-generation plants are all seen as important steps (ibid).

2.2. Finland

Raw wood

During 2004, the local supply of roundwood for industrial use amounted to 48.8 million cubic metres which with the 15.1 million cubic metres of imported roundwood created a total use of 63.9 million cubic metres, representing about a million cubic metre increase over the previous year. Approximately 0.5 million cubic metres of roundwood were exported. 2005 was a difficult year, with a six week lockout at the pulp and paper mills, which led to an expected 7 % decline in harvesting within Finland but a surprising 24 % increase in imported roundwood and chips (Anon. (Finland Timber Committee Report) 2005).

Wood energy

Wood-based energy accounts for 20 % of all energy consumed in Finland and supplies 60 % of the Finnish Forest Industry's needs. The government's initiative to promote renewable energy, and primarily bioenergy in Finland's case, has led to the following support measures being introduced:

- A carbon-based environmental fuel tax
- Support to electricity production when based on renewable resources
- Aid for investments aiming to develop and promote utilisation of renewable energy
- Support for the production of forest fuels
- Public financial support to develop and commercialise technology (ibid).

Certified forest products

Fully 95 % of Finnish Forests, representing 22 million hectares are certified under the Finnish Forest Certification System that is endorsed by the PEFC and the Dutch Keurhout Foundation. There is strong growth in demand for ECO-labelled products and forest companies have obtained certified chain-of-custody systems to earn PEFC-logo usage rights. There are approximately 75 PEFC logo license holders

representing the major share of wood procurement (55 million cubic metres), 10 million cubic metres of sawnwood, 2 million cubic metres of panels, 3 million tons of pulp, 2.3 million tons of paper and 0.5 million tons of paperboard (ibid).

Sawn softwood

Sawnwood (51 %) and plywood (21 %) are the main export products, with the remaining 28 % split among particle board, wooden furniture, fibreboard, wooden prefabricated houses, etc. Europe is the main export market for sawn softwood (particularly the UK, Germany, France and the Netherlands) accounting for 67 % of all exports. Growing price pressures and falling prices have led to a focus on other markets, such as Japan which has seen exports rise 14 % in 2004. Finnish domestic consumption of sawnwood is approximately 40 % (5.3 million cubic metres). It is expected that growing competition from Russia and other Eastern European countries will result in relatively flat prices for the near future (ibid).

Sawn hardwood

Sawn hardwood is a minor Finnish forestry sector accounting for less than 1 % of the total sawnwood production (ibid).

Wood-based panels

Plywood is the most important product in this sector, accounting for 70 % of the panel production. Finland is currently Europe's largest plywood manufacturer, accounting for 34 % of the total European output. There is a growing demand for plywood (accounting for a 4 % increase over 2003) as well as for fibreboard (12 % growth), with exports increasing and domestic consumption accounting for 60 % of all particleboard production. Fibreboard consumption remains flat with domestic consumption accounting for half of the market (ibid).

Pulp and paper

Overall pulp and paper production rose in 2004, with high capacity utilisation but falling export prices. There has been growth in printing (including newsprint) of 8.2 % over the previous year, with fine papers (wood free p&w papers) increasing 16.5 % and magazine papers (mechanical printing and writing papers) growing 5 %. Other papers and cartonboard production increased 6 % in 2004. Total export volume from the Finnish pulp and paper sector rose 7 % reaching a value of EUR 9.2 billion, with prices falling 5 % for paper and paperboard but remaining flat for pulp. It is believed that overcapacity and the falling US dollar led to the decline in paper prices (ibid).

2.3. Germany

The German market has been mixed for 2004, with changes in accounting for unemployment and new labour laws promoting greater participation in the employment market. In the forest sector, there is a growing trend for larger corporate units driven by improving financing conditions, and this improved finance market has led to substantial capital investment in former East German states. The new production capacity has led to greater competition, accelerated structural change and represents increased levels of automation. The economic upturn has been reflected in the forestry sector with total sales for 2004 reaching 78.1 billion Euros (versus 77.3 billion for the previous year).

The relatively high unemployment levels are one driver behind the government launching a Charter for Wood Promotion that addresses promoting the sale and use of timber with a goal of increasing timber consumption in Germany by 20 % over the next decade. The Federal Forest Inventory II indicate annual growth of 95 million cubic metres, with Germany having similar stocking levels of 320 cubic metres per hectare and comparable to Austria and Switzerland (Anon. (Germany Country Report), 2005).

Raw wood

54 505 million cubic metres of roundwood were harvested in Germany in 2004, representing an increase of 6.5 % over the previous year. Prices have generally been falling for all timber groups and species with the exception of some oak and industrial beech categories (ibid).

Wood energy

There was a 75 % increase of funding for renewable resources from 30.5 million Euros in 2004 to 53.6 million Euros in 2005, with approximately 2.7 million Euros targeted for research, development and demonstration. There is a tremendous opportunity to increase biomass energy production and this is being looked at seriously in Germany as one strategy to address energy concerns (ibid).

Certified forest products

The decision of the Federal Government to require that all timber and timber products procured for federal use must comply with the FSC or equivalent standards is driven by a government initiative to promote the industry's image. This initiative of federal purchase of FSC or FSC equivalent products has led to constructive rivalry among

certification systems (such as PEFC), and this coupled with the high voluntary compliance of the forest owners has led to more than 70 % of the German forest falling under management standards that substantially exceed the requirements of the Federal Forest Act. This, and a concerted effort by the German Government to encourage the timber trade to bar illegally felled timber, has led to a renewed focus on illegal logs and trade. There is a strong need seen for the EU Commission to present its proposals for an EU-wide legislation to cap illegal timber imports. Failing to see this occur, the German Government may pass state legislation as an interim step to address illegal sales and to promote forestry protection (ibid).

Value-added wood products

The furniture building industry (including materials other than wood) represents the largest sector, and accounted for 19.17 billion Euros in sales for 2004 (4.4 % increase over 2003) and employing approximately 122 000 in over 1 100 businesses (ibid).

Sawn softwood

The sawmill sector saw 2004 sales grow 5.7 % and production of sawn softwood reached 17.7 million cubic metres (a 1.2 million cubic metre increase over 2003). This is expected to fall over the next two years (ibid).

Sawn hardwood

Sawn hardwood increased by 6 % to nearly 1.14 cubic metres, with exports accounting for over half of this (ibid).

Wood-based panels

Sales of wood-based panels remained constant at 4.2 billion Euros (ibid).

Pulp and paper

The pulp and paper sector saw 2004 sales grow 3.7 %, and Germany's paper sector is now Europe's largest and is fifth globally behind the USA, China, Japan and Canada. Over 3 000 types of paper are produced with sales totalling 13.6 billion Euros, and employing over 46 000 at approximately 200 plants around Germany (ibid).

2.4. Hungary

2004 saw Hungary's economy continuing to grow with a 4 % increase in GDP for 2004. Growth is primarily driven by export and the increase of investments. Industry output increased by 6.4 %, with only a 1.1 % increase in domestic consumption but a 10.9 % increase in exports. Production of apartments reached 44 000, a new record

for the transition economy period. This economic and housing growth is expected to drive expansion in the wood processing sector (Hungarian Ministry of Agriculture and Regional Development, Department of Forestry, 2005).

Raw wood

Timber removal remains lower than the timber growth rates and forest regeneration is considered to be at a good quality and level. The forested area grew slightly from 2003 to 2004 increasing from 1.836 million ha to 1.843 million ha, with growing stock increasing from 330.9 to 334.4 million cubic metres. In 2004, approximately 6.66 million cubic metres (net volume) were harvested, virtually unchanged from the previous year (ibid).

Wood energy

Biomass is a growing sector of interest in Hungary, with several power plants involved in regional heat and electric energy supply deciding to convert to fuel wood burning. While plantations are a long term planned resource for these plants, their immediate needs will be sought from the same fibre supply that services the wood-based panel industry, leading to uncertainty in that sector (ibid).

Value-added wood products

It appears that the value-added sector plays a small role in the forest economy.

Sawn softwood

2004 saw 199 000 cubic metres of sawnwood produced, representing 66.6 % of the previous year – no explanation for this decline was provided in the country report (ibid).

Wood-based panels

In 2004, 597 300 cubic metres of plywood, fibreboard and particleboard were produced representing a 6.3 % increase over the previous year (ibid).

Certified forest products

By 2001, the Hungarian Privatisation and State Holding Company (ÁPV Rt.) had implemented (through the European Union PHARE project) the ISO 9002 quality assurance and ISO 14001 environment acceptability system at 19 forestry share holding companies. These companies perform planning and management on more than half of the forest lands of the country, representing 90 % of state owned forests. Forests under their management represent special national values because these

forested areas comprise the majority of Hungarian forest reserves. These companies manage 90 % of all forest reserves, out of which more than 35 % falls under nature conservation restrictions (Hungarian Ministry of Agriculture and Regional Development, Department of Forestry 2001).

Pulp and paper

This sector plays a small role in the Hungarian forest sector and had 2004 sales of US\$1.06 billion, representing an increase of 14.6 % over 2003 (Hungarian Ministry of Agriculture and Regional Development, Department of Forestry 2005).

2.5. Lithuania

In 2004, the forest sector accounted for 4.1 % of the GDP, increasing from 3.8 % the previous year. The EU remains the largest market, accounting for 66.4 % of forest product exports with Germany, Sweden and the UK representing the largest markets.

Raw wood

Felling amounted to 6.3 million cubic metres in 2004, representing a 2 % decline for the previous year (due to 4 % decrease in state forests) but generally in line with the increasing levels over the last five years. The majority of the roundwood (5.4 million cubic metres) was for the domestic market, with the exported roundwood falling 15 % to 1.2 million cubic metres, with Sweden, Latvia, Finland, Russia and Norway being large customers (Lithuania Forestry Statistics and Forest Assessment Department 2005).

Wood energy

There is increasing consumption of wood waste in the energy sector, and prices for fuel wood from state forest enterprise have been rising due to the increasing competition between heating plants and the wood-based board producers (ibid).

Certified forest products

FSC certification of state forests started in 2001, and in 2004 the last 14 state enterprises received their certificates, with certified state forests amounting to 1 million ha, representing half of Lithuania's forests. The Lithuanian Forest Owner Association has decided to utilise the PEFC system, and the standards have been established with endorsement underway last year. There are some private forests pursuing the FSC standard and Storo Enso miškas UAB is taking a leading role in that

approach. Manufacturers are pursuing a FSC chain of custody standards system that is anticipated to increase the number of FSC certified products. By August 2005, 20 companies were FSC certified (ibid).

Value-added wood products

The Value-added has continue to grow, with the most rapid growth in components (+27 %), wooden packaging and packing components (+22 %) and furniture for export (+20 %), with furniture exports totalling 327 million Euros for 2004 (ibid).

Sawn softwood

2004 sawn softwood reached nearly 1 million cubic metres, with the exports totalling 613 000 cubic metres. There were large market shifts, with the UK market remaining the major destination, but sales to Germany decreasing and those to North America increasing (ibid).

Sawn hardwood

Sawn hardwood production increased to 470 000 cubic metres in 2004 of which exports accounted for 313 000 cubic metres. Germany (32 %) and Belgium (24 %) were the main markets (ibid).

Wood-based panels

2004 production of particleboard reached 270 000 cubic metres, and this did not satisfy the local furniture industry requirements resulting in imports increasing 27 % to meet the shortfall. Fibreboard production increased 28 % (ibid).

2.6. The Netherlands

Raw wood

Harvesting of 735 000 cubic metres occurred in 2004 (Institute of forestry and forest products et al. 2005).

Wood energy

The Dutch government aims to produce 5 % renewable energy by 2010 and 10 % by 2020, half of which will be derived from bio-energy (ibid).

Certified forest products

The Netherlands Timber Trade Association estimates that approximately 14 % of all timber used in the Netherlands in 2004 came from certified sustainably managed

forests and a controlled chain of custody, with the government target for 2005 being 25 % and expected to be achieved (ibid).

Sawn softwood

2004 Sawn softwood consumption remained steady, totalling 2 245 million cubic metres, virtually unchanged from the previous year. Domestic production accounted for 175 000 cubic metres with 2 245 million cubic metres imported, with decreased amounts from Sweden, Finland and the Baltic states and increased imports from Germany (ibid).

Sawn hardwood

Domestic production fell for the third straight year, declining from 105 000 cubic metres to 98 000 (this includes 19 000 cubic metres of tropical wood that is sawn in the Netherlands) (ibid).

Pulp and paper

2004 Dutch paper and board production rose to a new record of over 3.4 million tonnes. Price pressures led to 9 % decrease of revenues with the average price falling to 535 Euros a tonne, the second lowest price level in two decades (ibid).

2.7. Norway

There was continued strong growth in the economy and that is expected to continue, with large growth in the petroleum sector and higher consumer and housing investment (Anon. (Norway Country Report), 2005).

Raw wood

Commercial timber felling for sawlogs, pulpwood and other industrial roundwood reached 7.4 million cubic metres in 2004, and this falls far lower than either growing stock or annual increment across the country. There are large differences in harvest levels across Norway, with higher levels in those areas close to major industries (ibid).

Wood energy

While the official figure for wood fuel is approximately 0.83 million cubic metres, there are other market indications that it is more likely in the 2.5-3.5 million cubic metre range, making it a substantial market sector for felled timber. This shortfall in reporting is due to a very large number of private transactions between forest owners and users as well as forest owners servicing their own fuelwood needs from their land (ibid).

Certified forest products

More than 95 % of the Norwegian forestry is certified under the PEFC system, with major imports of wood coming from Sweden and Finland with similar certification rates. Despite the high certification rates, the consumer awareness of certification appears to be low regarding domestic raw materials and finished products. Awareness is high, however, for imported tropical goods (ibid).

Value-added wood products

There is increasing demand for value-added wood products in Norway, generally driven by the strong domestic economy. Joinery products are strongly linked to new building and renovations, and new product development such as gluelam and massive wood building elements have also made significant contributions.

Sawn softwood

In 2004, 2 229 million cubic metres of sawn softwood was produced, with an additional 847 000 cubic metres imported and total exports of 481 000 cubic metres. With domestic consumption larger than production, imports are further expected to increase. The low domestic supply of roundwood is a serious challenge for the sawmill industry, having to rely on 12 % of their mill diet coming from Sweden and Finland (ibid).

Pulp and paper

2004 wood pulp production reached 2 527 million tonnes with an additional 92 000 tonnes imported and total exports of 660 000 tonnes. Paper and paper board production reached 2 294 million tonnes, with imports of 564 000 tonnes and total exports of 2 011 million tonnes (ibid).

2.8. Poland

Joining the European Union has acted as a stimulus for Poland's economy, with increased foreign investment, favourable exchange rates, and relatively good demand for Polish products. 2004's GDP rose 5.4 % and was the highest growth rate in seven years (Ministry of the Environment 2005).

Raw wood

The timber harvest for 2004 reached 32.7 million cubic metres, representing a 6 % increase over the previous year. Softwood accounted for 72 % with hardwood making up the remaining 28 % (ibid).

Wood energy

Historically coal has played a major role in Poland's energy needs but upon accession to the EU, Poland has adopted a strategic objective to raise current renewable energy from 3 % to 7.5 % by 2010. The majority of this additional power generation is anticipated to come from biomass energy plants and there are plantations being established to serve as future fibre sources for the energy plants. At this time, biomass plants are competing for the timber on the market which has led to some shortages (ibid).

Certified forest products

There is a common belief that certification is necessary given global market developments, and that has led to a decision to pursue FSC certification for the Polish forests. By October 2005, 16 out of the 17 Regional Directorates of State Forests and most of the forest experimental stations in Poland had obtained a Forest Management Certificate. Certified forests accounted for 76 % of the total forest area, representing 22 % of the FSC certified forest area in Europe. 90 % of the roundwood was obtained from certified forests. There are over 300 companies in Poland with the Chain of Custody certificate, and this is particularly important for the export market (ibid).

Value-added wood products

The Polish Value-Added sector is very dynamic, with furniture being the largest segment and generating US\$5 billion in revenue, with 92 % of this exported and 86 % of the exported furniture going to the EU-25 countries. Flooring (43 million square metres) and windows and doors (both totalling 12.8 million square metres) and 54 million shipping pallets were manufactured – all significant value-added industries (ibid).

Sawn softwood

2004 sawn softwood was 3.7 million cubic metres, representing an 11 % increase over the previous year. Over 3 million of this was for domestic consumption, which is expected to increase leading to greater imports of sawnwood or logs (ibid).

Sawn hardwood

2004 production of sawn hardwood was 641 000 cubic metres, representing a 13 % increase over the previous year, and there were 260 000 cubic metres of imports and 225 000 cubic metres was exported. 2005-2006 production is expected to reach 680 000 cubic metres, with little change in exported volumes and a 7 % rise in imports reflecting greater domestic consumption (ibid).

Wood-based panels

In 2004 Polish production of wood-based panels totalled 6.5 million cubic metres, representing an 11 % increase over 2003. The increase was most pronounced in particle and fibreboards, with the two types representing 63 % and 30 % of the wood-based panels made (ibid).

Pulp and paper

Fully utilized manufacturing capacity has constrained any growth in wood pulp production which in 2004 totalled 1 million tons. There is growing domestic demand, which will lead to significant increases in future imports. Paper and paperboard production for 2004 amounted to 2.6 million tons, and it is expected to increase 3-4 % a year (ibid).

2.9. Sweden

Raw wood

During 2004, 35.4 million cubic metres of sawlogs and 26.6 million cubic metres of pulplogs were harvested. Wood energy use represented 11.2 TWh of fuel chips and hog fuel, 11.9 TWh of sawdust and bark and 6.3 TWh of processed wood fuel (Anon. (Sweden Country Report), 2005).

Wood energy

Over the past two decades the use of biofuels, such as peat, timber, cuttings, etc. has more than doubled. At this time, biofuelled energy is the largest Swedish energy sector, exceeding that of hydroelectricity, nuclear and fossil fuelled systems. There are 60 bioenergy companies in Sweden with the bulk of the district heating provided in the densely populated areas – and this is expected to increase by 15 % during the first decade of this century (ibid).

Certified forest products

Approximately 73 % (16.5 million ha) of Sweden's forest land was certified by June 2005, representing an increase of 10 % over the previous year. The PEFC accounted for 6.6 million ha, with 23 000 forest owners. The FSC system accounted for 10 million ha. The market demand for certified timber products has increased in Europe, and while total volumes are still modest, it is expected that interest will increase with the larger customers (such as the UK) (ibid).

Value-added wood products

The wooden furniture sector has continually increased since the mid 1990's with 55 % of the exports going to the EU and 28 % going to Norway (ibid). The builder's joinery, carpentry and profiled wood sector involves some 30 companies and 2 600 employees. The turnover for this group of products accounted for approximately 4 billion SEK, with 73 % of the production being exported. Doors and windows represented an insignificant volume (ibid).

Sawn softwood

Sawn softwood production reached 16.9 million cubic metres in 2004, representing a modest increase from the previous year. Growth is expected to continue in this sector (ibid).

Sawn hardwood

130 000 cubic metres were produced in 2004, and this sector is a very small one within Sweden (ibid).

Wood-based panels

In 2004 the following wood-based panels were produced in Sweden, with changes from the previous year in brackets: Particle board 437 000 cubic metres (-6.2 %), fibreboard 137 000 cubic metres (-23.5 %), MDF 83 000 cubic metres (-4.6 %), plywood 71 000 cubic metres (-5.3 %), and hardboard 54 000 cubic metres (-13 %) (ibid).

Pulp and paper

2004 production of pulp was 12 million tons, a 2.3 % (280 000 ton) increase over the previous year, with increases expected for the next two years. Paper and paperboard rose from 11 062 to 11 589 million tons, representing a 4.8 % (527 ton) increase (ibid).

2.10. United Kingdom

Raw wood

Softwood mill deliveries increased by 3.4 % in 2004, and intake for sawmills increased 2.2 % and wood-panel use increased 2.6 %. The conversion of one UK integrated pulp and paper mill to 100 % recycled feedstock led to a decline of 31.4 % in deliveries to that sector. Pressures from growth in round fencing, an increase in exported pulpwood and the growing market in Ireland sawlog imports have led to some confidence in the

sector. Hardwood felling remains at a very low level compared to its potential (UK Forestry Commission 2005).

Wood energy

While there has been an increase in the recognition of forest production and wood residues from timber processing during 2004, the sector is still small with examples across the country of community and public building heating schemes employing wood energy. There is interest in increasing this sector, but there are significant challenges in coordinating the fragmented forest ownership to ensure secure supplies of fuelwood (ibid).

Certified forest products

Support for certification continues to grow, with the market for round and primary processed timber offering slightly higher prices over non-certified materials. Of the 132 sawmills in 2004, 49 of these held a Chain of Custody certificate. Approximately 40 % of all forestland in Great Britain is certified as being sustainably managed. The UK Government procurement policy announced in August 2005, that procurement officers could accept FSC, CSA (Canadian Standards Association), PEFC and SFI certified timber and wood products (ibid).

Value-added wood products

While furniture and joinery product makers are doing well, they are becoming concerned about interest rate increases. Flooring continues to do well, being driven by extensive television programming on home improvements. The market for engineered wood products in the UK has been generally increasing, with higher levels of prefabrication occurring for timber frame houses, with the timber frame market also increasing in importance (ibid).

Sawn softwood

Demand for construction, fencing, decking and pallets was strong in 2004, and prices have been stable. The actual number of sawmills in the UK continues to decline, with growth only occurring in those producing more than 50 000 cubic metres per annum (ibid).

Sawn hardwood

Price and supply shortages have led to increased imports of sawn hardwood, and there has been a decline in the number and output of UK hardwood mills (ibid).

Wood-based panels

A total of 1.5 million tonnes of UK green roundwood was used by the wood-based panels sector in 2004, representing a 2 % increase over the previous year. There is also growing use of packaging and other wood being diverted from being burnt or buried in landfills, and being used in this sector. There is potential conflict over fibre supply with the biomass energy sector. A total of 3.5 million cubic metres of wood-based panels were produced in 2004, with the majority being particleboard and OSB (ibid).

Pulp and paper

One of the UK's pulp and paper mills has converted to 100 % recycled content and this has resulted in increased exports of pulpwood. The other three mills consumed 438 000 tonnes of UK grown softwood and 214 000 tonnes of UK grown hardwood (ibid).

3. NON-WOOD FOREST PRODUCTS (NWFPS)

The production of NWFPs and forest services in many parts of Europe is just as important as wood production and that this importance is increasing. One of the challenges faced in this area is that there are no recognised standard classification of NWFPs and forest services although, in consultation with countries, FAO is working towards an internationally agreed classification and set of definitions. Examples of NWPS include (United Nations 2005a):

- Edible plant products (e.g. fruits, nuts, mushrooms, herbs and saps)
- Animal products (e.g. honey, game meat and pelts)
- Medicinal plants
- Bark, foliage and vegetation (including cork and cork products)
- Christmas trees
- Other non-food products (e.g. gums, resins and oils)

Forest services are addressed in the following section of the paper and include

- Recreation
- Mitigation of climate change
- Conservation of biodiversity
- Protection of soil, water and infrastructure
- Cultural aspects

The lack of market clearance for many of these products and services, along with the lack of agreed definitions leads to significant statistical challenges with inconsistent numbers and varying ways of aggregating the products.

Forest fruit and berries production is estimated to be of the order of 211 thousand tonnes, with an average annual value of production of about EUR 350 million. Countries with a significant recorded amount of forest fruit and berry production include the Scandinavian countries, Albania and the Czech Republic.

The little information available about trends suggests that the majority of production in Western Europe is consumed by the collectors and that the amounts have not changed very much. There is some evidence that the small amounts collected commercially have declined, due to increased competition from Eastern Europe and there is slight evidence of an upward trend in production in the few Eastern European countries that have statistics for more than a single year, but there is not enough data for this to be a reliable indication of a trend (ibid).

The potential supply of forest fruits and berries is far higher than demand in remote and rural forest areas, an example of this is that only 10 percent of the natural yield of mushrooms and berries is currently harvested in Finland. Closer to urban areas, natural supplies are under pressure - especially in countries where there is a strong tradition of personal collection of edible plant products. In a few cases, restrictions have been imposed to keep the harvest at a sustainable level (e.g. harvesting limits per person, restrictions of access to certain days, etc.) (ibid). The importance of mushroom and truffle gathering varies across Europe according to cultural traditions, growing conditions and the intensity of any management intervention. As with fruits and berries, the statistics create challenges, but an estimated production of 77 000 metric tonnes with a real value of EUR 263 million is one such estimate (ibid). Two thirds of this total value occurs in Europe with truffles being the highest value items collected. Honey production is again statistically difficult to estimate with the challenges of differentiating between honey production and domestic plants or that dependent on forests. An estimate of 31 000 metric tonnes with a 2000 value of EUR 34 million (ibid) exists but given the amount of information missing from a number of countries, the level of production and total value is far higher.

Medicinal plant use varies tremendously over Europe, with some countries in Eastern Europe having significant production, and with Germany and Italy being the significant consumers in Western Europe. Statistics are poor and while an estimate

of 33 000 tonnes with a value of EUR 118 million is available, the figures are in all likelihood a huge underestimation of the market (ibid).

Bark, foliage and vegetation (including cork and cork products) are another important NWFP sector. Annual production of cork is around 296 000 metric tonnes with a value of approximately EUR 209 million (ibid). The cork market faces significant competition from alternative products (such as screw or plastic tops for wine). Numbers for decorative foliage use are very poor quality, but an estimate of 45 000 metric tonnes and a 2000 value of EUR 49 million has been proposed, though this expected to be conservative (ibid). Christmas tree production is a major crop in some countries such as Denmark, with an estimated European production of 43 000 metric tonnes with a market value of EUR 444 million. Production in some countries (such as Ireland) has increased. Other non-wood products include beeswax, various gums, resins, and essential oils. Most of these are for relatively small and specialised markets, though resin production in Portugal, France and the Russian Federation is significant as is Eucalyptus oil from Portugal (ibid).

These statistics are far from satisfactory, but do generally indicate that NWFP use varies tremendously not only between European regions but also between countries, such as Italy and Germany being the heavy medicinal plant users in Western Europe. There is a growing NWFP awareness and we can expect more accurate statistics in the future.

4. DRIVING CONSUMER DEMAND FORCES IN THE FOREST SECTOR

This section of the paper will focus on consumer demand as a driving force and will address the following factors which are complex and inter-related (United Nations, 2005a):

- Population
- Income
- Forest accessibility
- Environmental factors
- Societal demands, changes in human needs, biophilia and green health
- Changes in industrial demand for forest products

Population

Population change can influence the forest sector in a number of ways. Population growth can lead to increases in demand for forest products and services. Changes in

the demographics (population structure) can lead to different patterns of consumption through consumers having different incomes, different needs and different desires throughout their lifespans. Growing populations can also lead to pressure on land-use and subsequent pressure on not only the extent of forest land but also how that forest land is utilised.

The population of Europe has consistently increased over the last half-century, reaching a population of 795 million in 2000, representing a 40 % increase over 1950's population of 568 million. Where, and when, this growth has occurred varies widely by region, with Western Europe seeing a 28 % increase in growth, Eastern Europe a 71 % increase, and the CIS a 40 % increase. Over the last six years, there has been a population decline in the CIS sub-region and some other European countries with migration of people to areas believed to have either a more stable society and/or economy.

In the future, the population is anticipated to change even further (see Figure 3). Western Europe's population has almost peaked and will then steadily decline. Eastern Europe's population is expected to peak around 2030 and then steadily decline. The CIS countries' population is anticipated to steadily decline (ibid).

Along with the factors of population size and structure, there is also the consideration of what location the people chose to live. Urbanisation has increased consistently across all three sub-regions since 1950, and it is expected to continue to increase in the future, particularly in Eastern Europe (ibid) (Figure 4).

When the change in population is combined with the process of urbanisation, the net result is that it is anticipated that the rural population in Europe will decrease significantly over the next 20 years, with it falling by 16 % in Western Europe, 13 % in Eastern Europe and 20 % in the CIS sub-region. When this is combined with the different age structure an even more striking process is demonstrated (Figure 5).

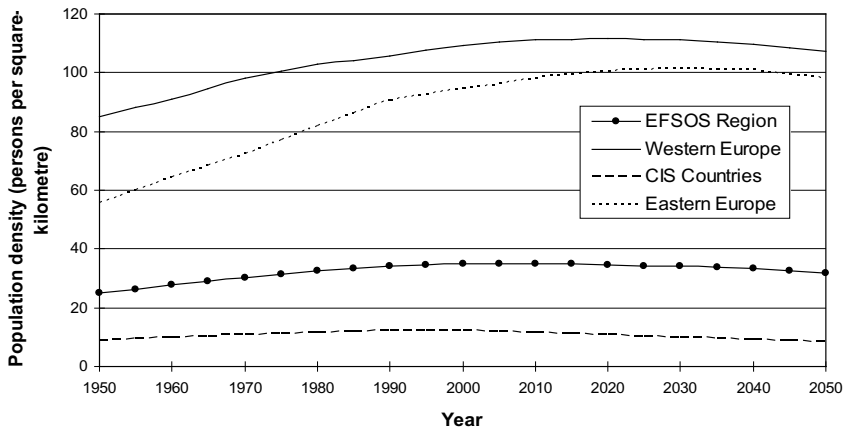


Figure 3. Trends and projections for the population of Europe from 1950 to 2050. (Source: derived from UN 2000 and 2002).

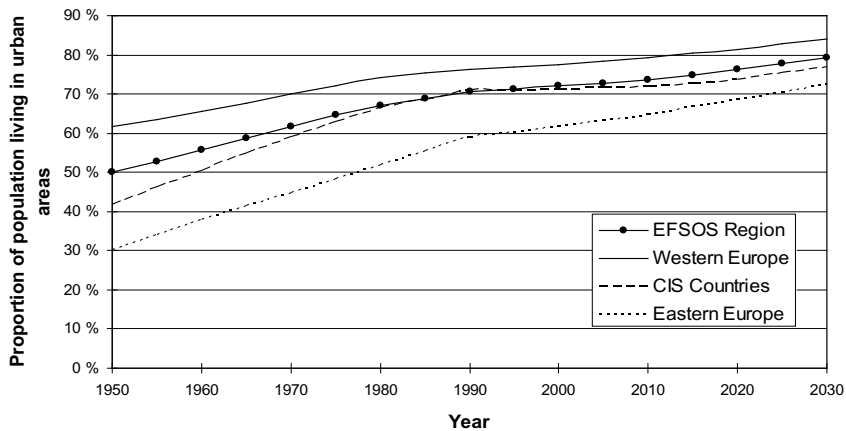


Figure 4. Trends and projections for the urbanization in Europe from 1950-2050. (Source: derived from UN (2001b and 2002).

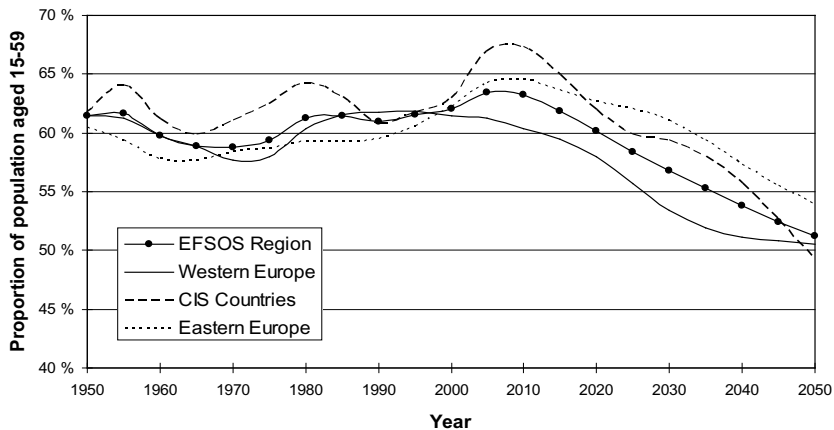


Figure 5. Trends and projections for the population of working-age Europe from 1950 to 2050. (Source: derived from UN 2002).

In short, we have an increasingly aged population, with fewer people falling within the working-age and most of the people living in urban centres as the likely future scenario in Europe. This will impact the forest sector in a number of ways, including reducing the rural workforce, making it increasingly challenging to attract workers to the forestry sector, and creating increased pressure to mechanise and automate in both harvesting and processing. One potentially positive impact of the urbanised and aging population is that it may increase the available land for forestry use (ibid).

There are differences between the urban and rural resident perspective on the roles of forests. The rural resident typically sees the forest with a more economic or products oriented perspective, while the urban residents typically place more importance on forest services (recreation, clean water, aesthetics, wildlife, etc.), and the growing number of urbanised residents is likely to see society's demands for non-wood forest products and services increasing relative to forest products (ibid).

Income

Economic growth is a very strong factor influencing the forestry sector, with prolonged and rapid economic growth leading to increased trade, investment, income and a growing demand for forest products and services. Economic growth has three main drivers, namely population, investment and total factor productivity – with education level and the ability to adopt new technology being important for the latter driver. In Europe, there are considerable differences between the regions of Europe for these factors.

While these have generally been positive in the last half century, there is growing concern about population change, and one potential strategy for Western Europe will be to enhance capital investment and human resources pursuing a strategy of technological advancement and knowledge-based growth (ibid). For Eastern Europe and the CIS sub-region, there is a large gap with Western Europe in terms of productivity and income levels, and the technology is generally far behind that used in the Western European sub-region. Potential strategies of promoting investment in the region (capitalising on the higher marginal productivity of capital) and importing technology are likely to prove to be successful and will be heavily influenced by the degree of integration with Western Europe and political and economic stability in the sub-regions (ibid).

Forest accessibility

It is anticipated that accessibility to forests will increase in the future, with the decreasing rural population and the reduced land pressure, along with increasing legal rights of access to the forest area. A stronger economy will also increase the access of the forests for a wide range of purposes, with the following factors contributing to increased access (ibid):

- Increased leisure time (reduced working hours and increased holidays)
- Improved rural infrastructure (roads, accommodation, etc.)
- Increased income available for non-essential services
- Increased car ownership (and also public transportation).

Given the increasing demand for forest access and recreation opportunities in forests, we can expect that forest owners will increasingly recognise this as a potential economic sector and manage their forests to cater to this sector.

Environmental factors

There are a number of climatic, biological and geographical factors that impact on forests, with the scale and scope of impacts varying tremendously between the sub-regions. These factors can be short-term in scale (such as the hurricanes that hit France, Germany and Sweden) over the past decade, or they can be extremely long-term – such as global climate change and the uncertainty this creates. An additional environmental factor is the structure of the forests themselves, with age-structure and growth rates being of particular importance.

It is generally accepted that warmer and wetter conditions are expected to occur in the future which will push temperate conditions northward. This will lead to both afforestation, faster growth rates and even species shift in both latitude and altitude. Fragile forest systems will diminish or disappear altogether and be replaced by other (more southern or lower altitude) systems. Southern Europe is expected to become hotter and dryer. More extreme climatic conditions are expected to occur (high winds, heavy rainfall, long droughts, etc.)

Along with the milder climate of recent time in Europe and faster tree growth, the harvesting has generally occurred at a lower level than regeneration, both working together to see the standing forest volumes and size increasing in Europe over the last fifty years. This increased forest base has a number of potential impacts on forestry; on one hand, it may open up the possibility to carry out less intensive forestry (lighter cuts, less chemical use, etc.); while on the other hand, it may lead to a downward

pressure on standing timber prices which would be a challenge for timber producers and a potential gain for timber processors (ibid).

Societal demands and changes in human needs

Societal and economic changes may also lead to a change in terms of human needs for the forests, with the relationship between consumption and per capita GDP indicated below in Figure 6.

The improvement in social, economic - and in some cases environmental conditions as well – generally leads to a shifting of focus of human needs from simple survival to hopes for higher value needs being attainable and even realized (ibid) (Table 2).

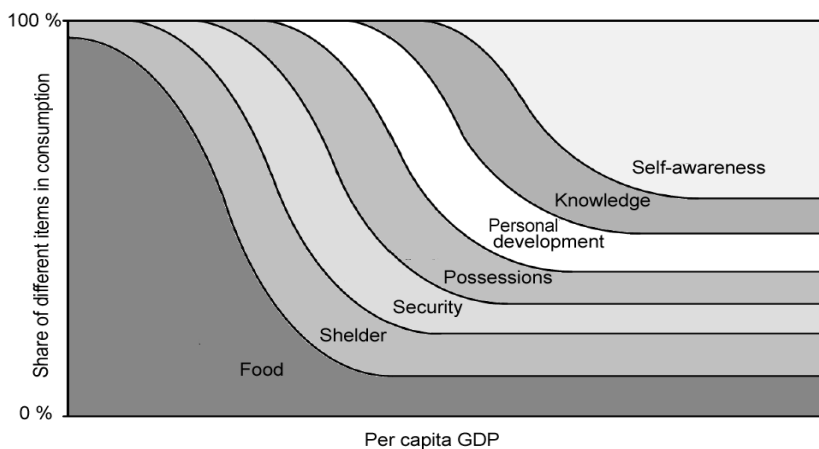


Figure 6. The relationship between human needs and personal income (Source Rennel 1984).

This growing market for non-timber forest products and forest services has been harder to evaluate, as both are harder to capture because of their smaller market role. European forests serve a wide range of societal demands and human needs. Some of these services provided include:

- Forests can serve as important recreation areas or landscapes, such as the community forests of Oslo, Copenhagen, and Freiburg.
- Forests can be valued for primarily their services – such as Vienna’s forest that is managed primarily for producing excellent drinking water.
- Forests can play a critical role in avalanche control, such as many of the forests that are found in Austria and Switzerland.

- Forests can be seen to play a critical role in tourism, or even in creating tourism opportunities, such as in the Danube-Carpathian Basin or Norway, Sweden and Finland.

Table 2. The relationship between the hierarchy of human needs and forest sector demands (Source Rennel 1984).

| Order | Human need | Demands placed on the forest sector |
|-----------|----------------------|--|
| Basic | Food | Harvesting of food (plants and animals) from the forest out of necessity. Unlikely to currently be important in most European countries. |
| Basic | Shelter | Demand for basic construction materials (sawnwood and wood based panels). Still very important in all European countries. |
| Basic | Security | Not very relevant for the forest sector. |
| Low | Possessions | Demand for wooden furniture, packaging materials and other articles. Still very important in all European countries. |
| Medium | Personal development | Demand for improved health and leisure. Important in richer European countries. Expressed as higher demand for forest recreation (including hunting and NWFP collection as a leisure activity). Greater interest in protecting the environment (for health reasons). |
| High | Knowledge | Demand for paper, especially for books, magazines and newspaper. Interest in learning about the forest environment (e.g. through organised recreation activities). Important in a few of the richer European countries. |
| Very high | Self-awareness | Demand for high quality forest products with a greater focus on fashion and design. Greater interest in active participation in forest affairs. Demand for environmental improvement for altruistic reasons. Important in some of the richer European countries. |

Forests providing recreation, water, avalanche control and serving as recreation and tourism areas serve obvious social roles. What follows now is a theoretical look at a growing realization of another role - forests and landscapes may play a fundamental role within society itself. This realization of the social role of forests is relatively recent and may play an increasing role given the increasing standard of living in Europe and the growing awareness, understanding and desire for non-timber services from forests.

One of the challenges we face as sentient creatures is the structuring of thought and understanding, and this is particularly evident in science with the influence of Bacon, Popper and others. Science is proving to be a wonderful (albeit limited) tool to understand the relationships between things, arguably the heart of knowledge, but at times, we have to deal with things that are not seen or understood clearly, concepts that may not be 'self-evident'. To this end, common sense can act as a powerful tool to identify relationships and to promote a more systematic or scientific evaluation of

them. Julie Stewart-Pollack, a professional designer addresses this in a 1996 article 'The Need for Nature', in which she argues the following:

Common sense is often a curious predictor of the truth; it causes us to suspect something is true long before science proves it to be so. Einstein understood this. So did Thoreau, Jung and Wright. They all believed that an important connection existed – beyond learning, beyond culture - between the natural world and human beings. Their theories, some proven and some still debated, began with their own experiences and observations, and grew into concepts that have changed our views of life. Today, a growing number of scientists, educators, architects, designers and environmental thinkers are working from that same source of common sense, producing theories and scientific evidence that could be the most significant body of knowledge the design profession will consider in the next few years. This body of knowledge yields a compelling, if controversial, premise: that human beings have an innate or hereditary need to experience and affiliate with nature, and this need for nature is an important determinant of our requirements for and responses to our environments (Stewart-Pollack 1996).

Sometimes, in order to better understand the world and its complexity, we need to suspend 'our reality' and consider the not-so-obvious. Perhaps we should take an approach akin to that of the famous Sherlock Holmes, who believed that 'when you have eliminated the impossible, whatever remains, however improbable, must be the truth' (Doyle 1890).

In 1984, the Harvard evolutionary biologist Edward O. Wilson advanced a concept considered as revolutionary by many and heretical by others, in which he argued that there is a genetic basis for our need for nature and our 'urge to affiliate with other forms of life' (Wilson 1984). The premise for this argument is that over the hundreds of thousands of years of human evolution in a world in which we had an intimate relationship with nature (in which we constantly interacted with and learned from the diversity of life), we developed a genetically-based emotional need to experience and affiliate with the rest of the living world. This coexistence over millennia with the natural world created an innate sensitivity to and need for other living things. Wilson refers to this need as a part of our 'ultimate human nature', a hereditary trait formed

when our survival and well-being depended upon how effectively we learnt from and coped with nature, the only environment that existed.

During this period, Stephen R. Kellert, a Yale University social ecologist was working on a values typology, essentially a typology of basic attitudes, in which people's basic values and perceptions of animals could be identified (Schnoeker-Shorb 2004). Like Wilson, Kellert was very much aware of human dependence on biodiversity and argued that: 'The emergence of an environmental ethic could lead to the realization that efforts on behalf of respecting and sustaining nature are really creative ventures on behalf of ourselves.' (Bormann and Kellert 1992).

Wilson and Kellert realized that they were approaching the same concepts of biophilia from different disciplines and together with 18 other scholars and scientists published 'The Biophilia Hypothesis in 1993', a book which argues that the ability of early humans to recognize characteristics in the natural environment not only assisted in their survival but as importantly elicited positive emotional responses (Wilson and Kellert 1993) such as fascination, inspiration, attraction, self-confidence, aesthetics, meaning and a sense of place (Stewart-Pollack 1996, Griffen 2004).

The sense of place, the sense of connectedness, has been investigated as well by sociologists and geographers. Anthony Cohen's 1985 book: 'The Symbolic Creation of Community' proposes that we not focus on the structures and forms of community organisation and life and instead focus on the analysis of meaning rather than the form, as such deal with culture rather than structure. Cohen goes on to argue that the community boundary serves a critical role in delineating differences between communities, and that these communities are held together by culture of symbolism (Cohen 1985).

The landscape or interface with nature that defines the setting and attributes of many communities (playing a role in defining the boundary) plays a key role in the symbolism of community. The geographer D.W. Meinig explores the imagery and symbolism of place in his seminal work 'Symbolic Landscapes' in which he describes the three archetypal landscapes of North Americans: The New England Village, the Main Street of a Midwest town and the Californian Suburb, each of which evokes positive powerful feelings (Meinig 1979). Meinig's three landscapes have 'built' elements as well as 'natural elements' within them. There are also the natural landscapes (such as Koli National Park in Finland, Geiranger Fjord in Norway, the Eiger peak in Switzerland) and others around the world that emotionally move people and have an apparent universal appeal.

In the book 'The Natural Alien', Evernden describes the disconnect or sense of isolation that humans have created between themselves and nature, a very artificial divide, that did not exist during our evolution (Evernden 1985). We have essentially 'lost our way' and found ourselves looking at nature rather than communing and being a part of it, and that is where health care is now taking some interesting developments. Evernden talks about the social construction of reality and the importance of this construction in creating a common cultural image or model, suggesting that it is: '...the production of a landscape photograph. If we assume that there is a normal photograph that represents what is actually present in the world, then the act accomplished by society is the taking of one small portion of that image and pretending that it is the whole.' (Evernden 1985).

It is this landscape or image, and our reluctance to re-evaluate the status quo that explains the periods or eras that society pass through. These landscapes and images described by geographers are very similar to the concepts of *Gemeinschaft* (roughly thought of as community) and *Gesellschaft* (either translated as society or association), in which there is also much which is not seen or which remains constant and immutable (Mitchell-Banks 1999). The widespread discussion of the biophilia hypothesis along with some more recent research indicates that nature or landscape, or even just elements of nature or a landscape can play a profound role in affecting how people feel and behave. There have been a number of seminal pieces on restorative environments that have raised the profile of nature and health (Kaplan and Kaplan 1989). There is evidence that the view of nature through a window may influence recovery from surgery (Ulrich 1984).

The continued growth of health costs, often increasing faster than other expenditures for either governments or businesses, has led to a renewed focus on how to reduce these costs by improving health care. A recent estimate of the costs of diabetes for the cohort of Americans born between 1931-1941 was approximately US\$133,5 billion by the year 2000, with sick days, disability, early retirement and premature death being the 'costs' calculated (Medical Study News 2004). While some of the patients would have suffered from Type 1 Diabetes (juvenile onset), the majority would have suffered from Type 2 Diabetes, which is adult onset and often effectively treated by strict diet and exercise (National Diabetes Education Program 2005).

What remains to be discovered are the subtleties of the implications of exercising outside versus in a gym or clinic for someone facing or experiencing Type 2 diabetes.

To take this another step in the abstract, is there an improvement in the prognosis if the exercise is done in a visually beautiful area versus a street in a major urban centre? Research by Hartig and Kuo have demonstrated that 'green landscapes' are more beneficial in relieving stress or assisting in maintaining attention than landscapes with only limited or completely lacking any elements of nature (Clay 2001). We are in the early days of this kind of research and much needs to be done to compare and contrast conventional health care with the use of health as an aid or approach in maintaining and recovering health. There is not only the challenge of establishing research projects to conduct this, but further determining what are the influences of nature over the life of an individual and does this have implications for future green health care?

Changes in industrial demand for forest products

The declining workforce population has been previously mentioned, which will result in higher wage costs to attract a workforce and increased pressure to automate or mechanise to reduce harvesting and production costs. In the construction sector, which is heavily dependent on timber products, the pressures on this workforce will have a profound impact on the use of forest products. This will likely lead to an increase in the use of engineered wood products (such as roof trusses, floor joists, etc), pre-cut lumber, modular or panelised construction, and a general trend in terms of factor assembly and pre-manufacture of wood products to reduce assembly cost and waste (United Nations 2005a).

5. CONCLUSIONS AND DISCUSSION

European forestry encompasses a very wide scale and scope of activities and roles within the societies of various countries. A broad overview of the general growth in forest products demand was addressed with housing starts in the United States generally playing a key role in market demand for Europe, but smaller markets such as Italy having significant market influence for countries such as Austria. Each of the ten countries overviewed experienced varying challenges and opportunities with their forestry sectors with both external and internal market demands influenced sectoral demand and performance.

We can expect to see an expanding array of engineered wood products for a number of reasons including: the desire to move up the value-chain and thus capture a greater revenue than just supplying raw materials; growing demands for increasingly

complex building requirements to meet earthquake and other safety codes, aesthetic demands and also in an attempt to reduce labour costs in the construction sector – a factor that is anticipated to continue to grow in importance with the falling workforce.

Certified forest products appears to be rapidly growing in market acceptance, with many countries such as Finland, Sweden, Norway, Austria, Germany, the UK all placing a growing emphasis certified products within the market. Non-governmental organisation lobbying and government purchasing schemes can play a key role in driving market demand for certified products.

NWFPs are obviously an important forest resource, with heavier pressures around the urbanised areas, particularly for mushroom and berry gathering. This is a difficult sector to monitor and manage due to the poor quality statistics and it being difficult to monitor NWFP use given the vast array of products and dispersed gathering areas. NWFP use may well increase in the future with the growing income and leisure times.

The forests will play a major role in supplying fuel for bioenergy production in the future, with this demand driven by a growing desire to wean countries off the fossil fuels that are not only rapidly increasing in price but also perceived to be increasingly unsustainable to use and a major contribution to climate change. This shift will be driven by governments setting explicit renewable energy generation targets and promoting alternate energy sources through an array of instruments including but not limited to: carbon-based environmental fuel tax; support to electricity production when based on renewable resources; aid for investments aiming to develop and promote utilisation of renewable energy; support for the production of forest fuels and public financial support to develop and commercialise technology (*ibid*).

The European population will soon peak and with the ongoing demographic shift to an increasingly elderly population, there will be changes not only in construction requirements (e.g. fewer homes for families with children, increasing multi-unit residences) but also in the available workforce to undertake that construction – a factor anticipated to lead to increased engineered wood products.

Incomes are generally rising, which will not only lead to an increased demand for higher value forest products but also with increased leisure and holiday time will contribute to growing demand for increased forest accessibility – something that may constrain traditional harvesting and forest products manufacturing but which could offer opportunities for the supply of high quality forest recreational use.

Environmental factors will play a number of roles, with a continued concern about addressing biodiversity and having parks and protected areas playing a role. Arguably though, climate change will play the longest role in the long-term, and the anticipated scale and scope of the impacts on forests and ecology as a whole are vast. Climate change is expected to result in a general movement of forest systems from south to north as well as from lower altitudes to higher ones.

Societal demands are changing not only as a result of increasing income and leisure time but also due to evolving levels of awareness and understanding which contribute to the evolution of human needs. There is a growing understanding of the role that forests, landscapes and nature play in our essential existence and they play not only a profound role in terms of how we relate to this world but also in our general health, well being and recovering from sickness and disease. With the rapidly increasing health costs, forests will likely play a growing role in green health and health care in general.

Europe is going through significant social and economic change, both of which will have both positive and negative impacts on the forest sector and the consumer demand for forest products. These impacts will differ both spatially and temporally not only in the different regions of Europe but even regionally within the nations themselves. Domestic consumption, import and export levels are all influenced by both internal (government policy, GDP, etc.) and external (currency exchange rates, trade agreements, export customer economic performance) factors. Large-scale change in population levels, composition and urbanisation when coupled with global challenges such as climate change will all impact the use of forest and the characteristics of consumer demand for forest products.

REFERENCES

- Anon. 2005. Finland country report. UN-ECE Timber Committee. Sixty-third Session. Palais des Nations, Geneva. September 27-30, 2005.
- Anon. 2005. Germany country report. UN-ECE Timber Committee. Sixty-third Session. Palais des Nations, Geneva. September 27-30, 2005.
- Anon. 2005. Norway country report. UN-ECE Timber Committee. Sixty-third Session. Palais des Nations, Geneva. September 27-30, 2005.
- Anon. 2005. Sweden country report. UN-ECE Timber Committee. Sixty-third Session. Palais des Nations, Geneva. September 27-30, 2005.
- Doyle, A.C., 1890 The sign of the four. Lippincott's Magazine.
- Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management. 2005. Austrian market report 2005. UN-ECE Timber Committee. Sixty-third Session. Palais des Nations, Geneva. September 27-30, 2005.

- Bormann, F. H. and Stephen R.K., 1992. Closing the circle: Weaving strands among ecology, economics and ethics. Ecology, economics, ethics: The broken circle. Edited by Bormann, F.H. and Kellert, S.R.. New Haven. Yale University Press.
- Clay, R.A., 2001 Green is good for you. *Monitor on Psychology* 32(4).
- Cohen, A.P., 1985. The Symbolic creation of community: Key ideas. London. Routledge.
- Evernden, N., 1985. The natural alien. Toronto. University of Toronto Press.
- FAO. 2005. Statistics Database. Rome.
- Griffin, C., 2004. An introduction to biophilia and the built environment. <http://www.rmi.org/sitepages/pid1079.php>
- Hungarian Ministry of Agriculture and Regional Development. 2005. Hungary country report. UN-ECE Timber Committee. Fifty-ninth Session. Palais des Nations, Geneva. October 2-5, 2001.
- Hungarian Ministry of Agriculture and Regional Development. 2005. Hungary country report. UN-ECE Timber Committee. Sixty-third Session. Palais des Nations, Geneva. September 27-30, 2005.
- Institute of forestry and forest products, Probos Netherlands' Timber Trade Association, VVNH Netherlands' Paper and Board Association, VNP Ministry of agriculture, nature and food quality. 2005. The Netherlands National Market Report. UN-ECE Timber Committee. Sixty-third Session. Palais des Nations, Geneva. September 27-30, 2005.
- Kaplan, R., and Kaplan, S., 1989. The experience of nature: A psychological perspective. Cambridge University Press.
- Kellert, S.R. and Wilson, E.O. (eds.). 1993 The biophilia hypothesis. Island Press.
- Lithuania Forestry Statistics and Forest Assessment Department. 2005. Lithuania country report. UN-ECE Timber Committee. Sixty-third Session. Palais des Nations, Geneva. September 27-30, 2005.
- Medical Study News. 2004. Financial impacts of diabetes on the American economy. http://www.news-medical.net/print_article.asp?id=6300
- Meinig, D.W. 1979. Symbolic landscapes. In: Meinig, D.W. (ed.). The interpretation of ordinary landscapes. Oxford. Oxford University Press.
- Ministry of the Environment. 2005. Poland country report. UN-ECE Timber Committee. Sixty-third Session. Palais des Nations, Geneva. September 27-30, 2005.
- Mitchell-Banks, P.J. 1999. Tenure arrangements for facilitating community forestry in British Columbia. Unpublished PhD thesis, University of British Columbia, Vancouver, Canada.
- National Diabetes Education Program. 2005. <http://www.ndep.nih.gov/>
- Rennel, J. 1984. Future of paper in the telematic World: A Jaakko Pöyry review. Jaakko Pöyry. Helsinki.
- Schnoeker-Shorb, Y.A. 2004. Values and vision: A profile of Stephen R. Kellert. Sustainable ways 2(1).
- Stewart-Pollack, J.. 1996. The need for nature. ISDesignnet. <http://www.isdesignnet.com/Magazine/Sep'96/SpeedNature.html>
- UK Forestry Commission. 2005. United Kingdom country report. UN-ECE Timber Committee. Sixty-third Session. Palais des Nations, Geneva. September 27-30, 2005.
- Ulrich, R.S. 1984. View through a window may influence recovery from surgery. *Science*, 224, 42-421.
- UNECE/FAO. 2005. Timber database. Geneva/Rome.

- United Nations. 2000. Forest Resources of Europe, CIS, North America, Australia, Japan and New Zealand. United Nations, Geneva, Switzerland.
- United Nations. 2001b. World urbanization prospects: The 2001 revision. Department of Economic and Social Affairs, United Nations, New York, United States of America.
- United Nations. 2002. World population prospects: The 2002 revision. Department of Economic and Social Affairs, United Nations, New York, United States of America.
- United Nations. 2005. UNECE Timber Bulletin Volume LVIII (2005). Forest Products Annual Market Review 2004-2005. Geneva.
- United Nations. 2005a. UNECE European forest sector outlook study. 1960-2000-2020 Main Report. Geneva.
- Wilson, E.O., 1984. Biophilia: The human bond with other species. Cambridge, Massachussets.

OWNERSHIP AND PROPERTY RIGHTS – FACTORS RELEVANT FOR INNOVATION AND ENTERPRISE DEVELOPMENT IN SMALL-SCALE FORESTRY

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SUMMARY

Ownership and property rights (OPR) system in small-scale forestry is characterised by costly property rights enforcement, diseconomies of scale, and common pool resource dilemma. The paper applies the theory of property rights to analyse the OPR system influence on enterprise and innovation development. Four criteria were considered relevant for the study: security of rights, definition of the content, transferability of the rights and owners' participation in the definition of the rights for forest resource utilisation. Descriptions of the OPR systems in the national COST E30 reports (see Jagér 2005) were used as empirical data to illustrate some barriers to enterprise development according to the four criteria above. Several types of re-arrangements in the OPR systems were identified as possible solutions to the problems of enterprise development in small-scale forestry: separation of forest ownership attributes; integration of forest positive externalities; and public allocation solutions.

1. INTRODUCTION

1.1. Property rights

In most European countries, private forest estates indicate ownership fragmentation. In countries such Croatia, Bulgaria, Poland or Romania the forest properties less than two hectares represent 80-90 % of the total area of private forests. In other countries such as Finland, Norway, or Austria approximately 60-70 % of the private forests are less than 20-25 hectares. From the viewpoint of ownership and property rights system, especially the very small-scale forestry conditions are characterised by costly property rights enforcement, diseconomies of scale and common pool resource dilemma.

The enforcement of property rights means efforts to consolidate the ownership (e.g. efforts to obtain a title on land, efforts to identify and to draw up the boundaries of the property and efforts to cope with ownership fragmentation); to secure exclusivity of rights (e.g. secure against timber robbery, against tacking-over by the State,

against illegal use of the forestland); and to solve conflicts related to the use of the forest resource (North 1990, Barzel 1997). The more fragmented the ownership is, the greater are the costs to enforce the property rights on forests and forestland. Moreover, in small-scale forestry, due to the rare participation of the owners on the market, the market information is costly and the revenue from timber sales may be lower than the real market value.

In the case of small-scale forestry, a complex mixture of rights due to the various regimes of forest assets utilisation leads at the end to a common pool resource dilemma (Bouriaud and Schmithüsen 2005). The role of ownership is minimised in the final bundle of rights. Many forest assets are unspecified (biodiversity, carbon sequestration, protection, recreational services, etc.), which generates conflicts when capturing them. Secondly, other forest assets are *de jure* open accessed (game in some cases, berries, mushrooms, medicinal plants and herbs). Thirdly, some other forest products are difficult to secure from collective consumption, therefore these products are *de facto* open accessed and harvested.

The present study on the OPR system focuses exclusively on forests hold by other entities than the State. The choice is based on the hypothesis that the State as forest holder is always in a position to avoid diseconomies of scale that affect a significant part of the private forests. The paper describes first some features of the OPR system in small-scale forestry in selected EU countries. Then the theory of the property rights is briefly introduced and four criteria relevant for innovation behaviour and enterprise development in small-scale forestry are discussed. Finally, the results present barriers and solutions of enterprise development in small-scale forestry, is followed by study conclusions and policy recommendations.

1.2. Basic characteristics of small-scale forestry in Europe

The study is based on the description of the OPR systems in the country reports provided by the participants to the COST Action E30. Especially two parts of the country reports were considered relevant for the study, namely, Part 2, "Small-scale forestry practices" and Part 5, "Forests and ownership" (Jagér 2005).

According to the country studies, it is evident that small-scale forests are typically owned by individuals (private persons); that the owners used to be a farmers/rural inhabitants, but the situation is changing and in the future a large number of owners are indeed urban and employed by other than agricultural sector; that the decreasing timber

revenues and changing socio-economic conditions lead to increasing abandonment of forests, non-management of forests or minimal intervention strategies. It may even happen that the boundaries of forest properties are not known by the owners in the future. When forests are harvested, timber sales may not be connected to market prices, and the sales may be triggered by the owner's immediate need for money (sons or daughters wedding or departure to university).

Social and cultural factors directly influence the attitude of owners towards the forests and the context of the enterprise development. The increasing demand for recreation and for secondary residences determines a change in the production mode: forest is used more and more for private amenities (United Kingdom, Romania), is regarded as an extension of the garden (Norway), or as a "piece" of nature to preserve (the Netherlands).

Innovative solutions seem to appear in the services for forest management. A trend noted in Austria and in Finland, for example, is to outsource work and build-up forest co-operatives arrangements, and to sell timber by forest management associations (Rametsteiner et al. 2005, Aarne et al. 2005). In Finland, private forest estates are managed and run businesslike on behalf of many individual owners in joint ownership systems. The development of co-operative and associations is a relatively recent phenomenon in Portugal and Romania (Mendes and Feliciano 2005, Bouriaud et al. 2005).

Some structural features of small-scale forestry in the COST Action E30 participating countries are presented in Table 1. The form of ownership is balanced between public and private, except in Austria, Finland, Norway and Portugal, where private ownership clearly dominates. The number of private forest owners is not known in all countries. Sometime the statistics are not available (for example, forests ownership less than five hectares are not registered in the Netherlands), and sometime the statistics consider only the number of forest holdings. The average area of private forests varies from less than one hectare in Croatia and Romania to more than 10 hectares in Ireland, with the exception of Norway and Finland, where the size of average holding is considerable higher.

2. ANALYTICAL FRAMEWORK

The OPR system in the context of innovation and enterprise development is considered to include a bundle of economic and legal rights on the utilisation, creation

and appropriation of value from the forest resource. OPR theory (Demsetz 1967, Alchian and Demsetz 1973, North 1990, Barzel 1997) supports four criteria to analyse small-scale forestry, presented in the Table 2. The criteria distinguishes between the ownership, as legal entitlement to own forestland, and property rights, as effective rights to use the forest land and the forest resource.

Table 1. Share of private and small-scale forestry in selected European countries (Jagér 2005).

| Country | Private forest (1000 ha) | Private forests (%) | Private holdings/ owners (1000) | Category of holder mentioned in the national statistics | Average size of private holdings (ha) | Small scale forests (% of total private forests) |
|----------------|--------------------------|---------------------|---------------------------------|---|---------------------------------------|--|
| Austria | 2938 | 80% | na | Individuals, community forests | na | Less than 5 ha: 28,3% Less than 10 ha: 60,9% |
| Bulgaria | 322.4 | 8.1% | na | Private (individuals) | less than 2 | Less than 10 ha: 95% |
| Croatia | 461.1 | 19% | 599 | Private individuals | 0.76 | Mainly less than 2 ha |
| Denmark | 223.9 | 46% | 24.8 | Private individuals | 9 | Less than 2 ha: 1.9% Less than 5 ha: 7.1% Less than 10 ha: 13.7% |
| Finland | 1200 | 61% | 446 | Private (non-industrial owners) | 26 | Less than 5 ha: 35% Less than 20 ha: 63% |
| Germany | 4824 | 46% | 860 | Private (individuals and companies) | 2.2 | Less than 1 ha: 12% Less than 10 ha: 40% |
| Hungary | 732 | 40% | around 300 | Private (individuals and companies) | around 2.4 | na |
| Ireland | 282.9 | 41% | around 17 | Private individuals, farmers mostly | 10.6 | Less than 5 ha: around 30% |
| Italy | 3859 | 60% | na | Private individuals, | 7.5 | Less than 5 ha: 5.7% Less than 20 ha: 16.5% |
| Lithuania | 665.7 | 32.2% | 222.2 | Private owners (individuals mostly) | 3 | Less than 1 ha: 24.7% Less than 5 ha: 74.4% Less than 10 ha: 90.1% |
| Netherlands | 120 | 33% | unknown | Private owners (individual) | na | Less than 5 ha: 50% |
| Norway | 5502 | 97.4% | 122.2 | Private (non-industrial owners) | 45 | Less than 25 ha: 67% |
| Poland | 1544 | 16.8% | around 1500 | Private owners, individual mostly | 1 | Less than 2 ha: dominant |
| Portugal | 3129 | 93.4% | na | Private owners individuals and companies | na | Less than 4 ha: 15% Less than 10 ha: 22% (50% Northern&Central region) |
| Romania | 500 | 7.8% | 700 | Private owners individuals | 0.7 | Less than 1 ha: 80% |
| Switzerland | 326 | 28.8% | 250 | Private owners individuals | 1.35 | Less than 10 ha: 4.9% Less than 20 ha: 14.3% |
| United Kingdom | 1110 | 43% | na | Private owners individuals | na | Less than 2 ha: 4% Less than 10 ha: 11% Less than 20 ha: 17% |

Forest ownership characterised by three main rights: use, possession and alienation, is an entitlement to own real estate (the forestland holding). There are two forms of forest ownership, the private and the public, and several categories of holders (private, public entity, individual, etc.) (Bouriaud and Schmithüsen 2005). The combination of the form of ownership with the category of the holder leads to various ownership structures from a country to another. Though private and public ownership can enhance satisfactory economic performance, an argument in favour of private ownership is the possibility to use the land as collateral.

Property rights are rules governing the use of the forest resources. The rights to forest resource utilisation are classified in five categories (Schlager and Ostrom 1992): right to access, right to withdrawal, right to manage, right to exclude and right to alienate. The access right (the right to enter a defined physical property) and withdrawal right (the right to capture products from a resource) are operational rights – rules that govern the daily use of the resource (Schlager and Ostrom 1992). The management rights signify that the holder has the ability to regulate internal use patterns and transform the resource by making improvements. Individuals who have the right of management have the authority to determine how, when, and where harvesting from a resource may occur, and if and how the structure of the resource may be changed (Schlager and Ostrom 1992). The management, exclusion and alienation rights are collective-choice rights.

3. BARRIERS FOR ENTERPRISE AND INNOVATION DEVELOPMENT IN SMALL SCALE FORESTRY

For each of the four criteria introduced in Table 2, some aspects are underlined below to illustrate the barriers on enterprise and innovation development in small-scale forestry from the viewpoint of OPR system.

3.1. Criteria A. Securing rights: uncompensated public servitudes

In the case of compulsory duties, the transfer of value is from private to public without compensation. Ensuring the ecological or recreational forest functions is a public servitude if the additional costs of forest management are not compensated, or if it is too costly for the forest owner to access the compensation. For example, public access in valuable tourism areas imposes higher pressure on forests but the owners are only seldom compensated from the damages/additional costs occurring because

of the tourism. A typical public servitude is the Portuguese forest owners' obligation to remove combustible material from their forests. Also, until recently the Romanian forest owners have not received any compensation or income from lease of the forestland for hunting activities.

Security of rights criteria covers more dramatic situations than the examples above, such as taking-over private property to the State (nationalisation), timber robbery, property rights infringement in the process of restitution or privatisation, uncertainty of rights in forest concessions, etc.

Table 2. Criteria to look at in analysing the OPR system for enterprise development.

| Criteria | Underlined hypothesis | Optimum level | Why important for enterprise and innovation development? |
|---|--|---|---|
| A. Security of the rights | Secure the rights against taking over, and against any partial violation (access, withdrawal, management, exclusion, alienation) and restriction. | Property infringements are sued and punished. Property is restored (in countries in transition). All restrictions of the property are compensated. | Guarantees investment security. Ensure exclusivity. |
| B. Definition of the content of rights | Strongest: Clear definition lowers private transaction costs related to the rights identification, measurement, monitoring. Attenuated: Clear definition facilitate State regulation and private transactions for solving conflict over resource utilisation. | Strongest: Owners have no restricted ownership attributes (usus, fructus, ab usus). Attenuated: Owners' right to manage the resource are legally restricted according to social goals. | Rights specification to reduce rent dissipation. Regulate access and withdrawal rights. |
| C. Transferability of the forest asset | Strongest: Free exchange will lead to an optimal distribution of rights. Attenuated: Free exchange allows the organisation of the production. | Strongest: Free, no restricted forest asset transfer. Attenuated: Free exchange with limited State intervention (incentives). | Land consolidation against diseconomies of scale. Organisation of production/ services for specific forest attributes. |
| D. Participation of owners in defining the collective-choice rights | Participation of owners in defining the rules of forest management, exclusion and alienation legitimates the process and reduce conflict. | Partnership-based schemes between the State, as representing the social interests, and the owners while deciding about resource utilisation and harvesting. | Allows strategic development/planning of forest activities. Reduce the cost of information. |

3.2. Criteria B. Definition of the content of rights and the common pool resources dilemma

Everyman's right on mushrooms and berries is accepted in many countries (Finland, Sweden, Bulgaria, Romania, Norway, Lithuania). In Lithuania, Finland and Romania, for example, the income from mushroom picking is not subject to taxes. The open access that everyman's right imposed can be seen as an obstacle for local exploitation by the owner or other local inhabitants. On the other hand, open access contributes to some extent to poverty alleviation.

The open access on forest products such as berries, mushrooms, or medicinal herbs is regulated by general rules or 'ethical rules', like in Sweden (Vail and Hultkrantz 2000). The general rules are such as: "do not disturb the owner's privacy or damage their property", "do not collect endangered species", etc. Particular rules are related for example to the quantities and methods allowed for collection. It is worthwhile mentioning here the exclusion of the "outsiders" from the harvesting of cloud berries in Norway. That means that the rights are taken out from the public domain and granted to a certain local community.

In a few cases, the harvesting of non-wood forest products is prohibited for the large public. However, it is difficult and costly to ensure the exclusivity in practice, and it is difficult also to distinguish between commercial and recreational picking. Thus, in practice, the picking of mushrooms or berries remains in the public domain, regardless of who legally holds the exclusive right on mushroom or berry harvesting.

One other example of forest amenity that has remained in the public domain consists in the shadow value of forests for the real estates. Particularly in the United Kingdom, whilst the presence of forests increases the value of real estates, the forest owners are not able to capture any part of this value. The forest contribution to the beauty of the landscape, for example, is a forest attribute accessed and consumed without compensation. The free transfer of the value in this case is undergone from private domain (forest) to private domain (housing estate).

3.3. Criteria C. Transferability of forest assets: legal impeachments to innovation development

The transferability of the forestland is affected by the missing or ongoing land title registration in countries from Eastern and Central Europe. High transaction fees prevent owners from registering the forest land and exchanging it on the market,

particularly when the area is small. The transferability is affected also by the pre-emption rights, practiced in Romania, Slovenia and Norway, for example, in favour of the State, neighbours or member of the forest community. Sales of forestlands are strongly regulated in Norway, where the authorities must approve the prices and the new owners of properties larger than 10 hectares.

In some other countries, the rights can not be transferred because they are not legally determined. For instance, the right to access the private or public forests for recreational purposes in Romania is not regulated and is based on customs (unwritten rules). In Portugal, France, Austria and Italy, the owners have the right to disagree with the public access in their forests. However, in practice the owner can hardly prohibit the public access and exclude others from recreational activities, including picking of berries, mushrooms or plants. Accordingly, the law does not often clearly distinguish between the recreation practiced as individual activities or the recreation practiced on commercial basis. Therefore, the owner can not rent a right (the right to practice the recreational activities on commercial basis) if this right does not exist (it is not legally determined).

Finally, the transfer of land or of any right associated to the land is not possible when the owner is unknown or when the ownership is in litigation. In Italy, for example, the amount of abandoned land can be at the magnitude of 1.2 to 1.6 million hectares, and it is a growing trend everywhere in Europe to abandon forest land and loose the property boundaries. In Lithuania, 18 % of forests have unknown owners as a result of the privatisation/restitution process.

3.4. Criteria D. Participation of the owners to the elaboration of the collective-choice rules

The collective-choice rights are the management, the exclusion and the alienation rights. The management rules are defined in the forest management plans or in the process of local forest planning.

Historically the withdrawal of timber and the management of forests for timber yield have been restricted in Europe to follow the sustained forest yield principle. The restrictions on withdrawal have even re-enforced to include multi-functional, sustainable forest management. Together with the long term production constraints, the restrictions brought by the forest management planning play a role against innovation, in the sense that they limit the space for new products and modes of production. Moreover, the forest owners have rarely the possibility to participate in

the planning process and to influence the settings of rules for forest management, particularly in Eastern and Central Europe (Bouriaud 2002).

4. RE-ARRANGEMENTS OF THE OPR SYSTEM IN FAVOUR OF ENTERPRISE DEVELOPMENT

Several arrangements of the OPR system were identified in selected countries as having the capacity to attenuate the diseconomies of scale, the fragmentation of the decision-making, the common pool resource problem or the informational asymmetry affecting small-scale forestry. The first category concerns the separation of the ownership attributes. The second is the integration of public servitudes, and the third the public allocation solutions.

4.1. Separation of forest ownership attributes

Different types of forest production organisation are based on the separation of the ownership on land, and ownership on other forest attributes. In the countries in transition, associations were created in the first stage to secure the ownership rights, as in Romania during the previous decade, when forest owners organised themselves for higher protection against timber thefts. Associations were created also to secure the rights in lobbying in the restitution process. In the second stage, associations were created to lobby for involvement in collective-choice rights definition, e.g., setting of forest management rules. These two first stages did not require the separation of the ownership, and they were not new modes of production. However they helped to set-up the basic premises of OPR system (criteria A and D): securing the rights and participating in the definition of the collective-choice rights (to manage, to exclude and to alienate). The above examples lobbying for restitution process, or representing the owners in the political process, illustrate the power-sharing approach. Other example of power-sharing approach is the Federation of Forest Support Groups in the Netherlands. The group is constituted from private owners, nature conservation group and municipalities. The co-operation in this group – or “power-sharing” – does not lead automatically to income gain, but allows owners to participate in the definition of the collective-choice rights, such as forest management rights.

In the third stage, foreseen also in Romania, the forest ownership can be divided. The owner keep the ownership, while the association becomes the holder of the management rights, being involved in forest management planning, harvesting

and selling of timber. The association can be also the holder of access and withdrawal rights if it has been created with the specific aim to regulate the tourists' access for picking of non-wood forest products.

The forest owners' associations can be local or operate at larger scale, and different benefit sharing approached can be applied. For example, in Norway three quarters of the industrial roundwood is brokered by nine regional associations (Lunnan et al. 2005). The associations conduct price negotiations with purchasers and broker timber from the small woodlots owned by the members. In Austria, the Austrian Forest Management Association organises joint timber sales on 2 million cubic meters of timber annually. In Sweden, small-scale farmers and woodlot owners use association to organise collective marketing (Vail and Hultkrantz 2000). In Portugal, associations have been created to better utilise the financing opportunities (Mendes and Feliciano 2005).

The separation of ownership attributes can go further than the binary combination an owner - a second right holder. In Portugal, for example, the separation of ownership attributes involves in some cases the owner of the land, the renter or proprietor (pulp and paper industry) and the manager of the forests.

4.2. Integration of forest positive externalities to forest management

The integration of forest externalities to forest management can happen in accessing the ownership or in accessing the property rights. Accessing the ownership was the strategy followed by the Natuurmonumenten and the Provincial Landscape in the Netherlands, and the Nature Conservancy, in the United Kingdom. Both mentioned agencies were interested in maintaining the level of the forest positive externalities, thus they bought land to generate the wanted externalities. In the Netherlands, 16 % of forest estates are owned by nature conservations organisations (Hoogstra and Willems 2005).

The second strategy is to obtain a payment for the forest externalities, e.g. through a transfer of property right from public domain into a private domain, or vice versa. The examples mentioned in the COST E 30 countries reports include the charges for car parking in the private forests; the charges for accessing the forests or for providing some specific facilities and the payments made to forest owners for nature conservation contracts (in Austria, Finland, Estonia).

4.3. Public allocation solutions

The allocation of rights through State intervention is the easiest way to modify the OPR system, yet not the most socially accepted. In this case, the property rights should be re-allocated to ensure that one management agent has a complete control of the asset. Public allocation can influence directly the size of private forest holdings as is the case if restrictions are imposed to control the heritage of forestland or its transmission through selling. Recently, the Forest Act of Denmark from 2004 introduced a major change, to prohibit the split up of physical coherent forests into smaller holdings. The reason was that splitting up of forests would be disadvantageous to recreation (Helles and Thorsen 2005).

Some changes are in progress in several countries to better delineate the rights over forest utilisation. In Scotland, some consultations have been undergone in order to increase the opportunities to purchase or lease forest land belonging to the public domain. Under Countryside and Right to Way Act, United Kingdom, it has become possible to designate land for public access into perpetuity (Slee et al. 2005). Changes are in progress in Italy to take off the mushrooms collection from the everyman's right regime (Petenella et al. 2005). It is likely that these changes will evolve when the value of the attribute considered increases substantially. According to Alchian and Demsetz' demonstration (Demsetz 1967, Alchian and Demsetz 1973), property rights are established when it becomes economically efficient to do so. Thus, for example, the property rights on wildlife territory were established past in the history when the market of furs was developed.

5. CONCLUSIONS AND POLICY IMPLICATIONS

A change of the property rights in small-scale forestry that would enhance economic opportunities for the enterprise development does not necessarily involve a reform of ownership. The policies can improve the transferability of forest land and of other forest attributes through regulatory and incentive means, as well as through improving the security of the property rights or the better involvement of forest owners for defining the rules for forest management. The rights on some forest attributes can be clarified also by State intervention, e.g., the public access in forest, the practice of recreational commercial activities or the withdrawal of non-wood forest products.

The co-operative solution should be supported whenever possible. Only in the absence of co-operative behaviour should the State take the role of service provider

and have the exercise of the management right. Joint management schemes can be a successful benefit-sharing approach to ensure the social desired level of public services. The owner keeps the ownership on forest amenities, and the State manages the timber flow as now, but via regulatory means.

Separation between the ownership on forest asset and the management rights appears to be a positive option for the development of forest-based enterprises and innovations. Voluntary and un-restricted separation of ownership attributes can help owners to obtain additional incomes through selling of rights over forest utilisation or to open new markets for service providers or to allow owners to focus on one forest asset attribute more efficiently. Unspecified rights, on the other hand, mean latent opportunities for value creation. Individual rights specification and the separation of ownership on the asset attributes can lead to an increase of the net gain from exchange (Barzel 1997).

A noticeable remark concerns the implementation of institutional arrangements. The OPR systems are specific of a context, and so are the policies supporting them. It is worthwhile to remember, therefore, that the cultural aspects of the OPR systems in forestry, and particularly in small-scale forestry, are still insufficiently known.

REFERENCES

- Alchian, A. and Demsetz, H., 1973. The property right paradigm. *Journal of Economic History* 33:17-27.
- Barzel, Y., 1997. *Economic analysis of property rights*. Second edition. Cambridge University Press. Reprinted 1999. 161 p.
- Bouriaud, L., 2002. *Economic and policy analysis of property rights allocation in Central and Eastern European countries*. Doctoral thesis, ENGREF Nancy, 350 p. In French.
- Bouriaud, L., Nichiforel, L., Nastase, C., Dragoi, S., Padureanu, L. and Borlea, F., 2005. Romania. Country Report. In: Jáger, L. (ed.), 2005. *Forest sector entrepreneurship in Europe: Country studies*. *Acta Silvatica & Lignaria Hungarica*. Special Edition 2005:643-694.
- Bouriaud, L. and Schmithüsen, F., 2005. Allocation of property rights on forests through ownership reform and forest policies in Central and Eastern European countries. *Swiss Forestry Journal* 156(8):297-305.
- Demsetz, H., 1967. Toward a theory of property rights. *American Economic Review*. Papers and proceedings 57(2):347-360.
- Helles, F. and Thorsen, B.J., 2005. Denmark. Country Report. In: *Forest sector entrepreneurship in Europe: country studies*. *Acta Silvatica and Lignaria Hungarica*. Special edition 2005:145-170.
- Hoogstra, M. and Willems, A., 2005. The Netherlands. Country Report. In: Jáger, L. (ed.), 2005. *Forest sector entrepreneurship in Europe: Country studies*. *Acta Silvatica & Lignaria Hungarica*. Special Edition 2005:467-482.

- Jáger, L. (ed.), 2005. Forest sector entrepreneurship in Europe: Country studies. *Acta Silvatica & Lignaria Hungarica*. Special Edition 2005. 811 p.
- Lunnan, A., Barstad, J., Mitchell-Banks, P., Nyrud, A.Q., Stordal, S. and Vennesland, B., 2005. Norway. Country report. In: Jáger, L. (ed.), 2005. Forest sector entrepreneurship in Europe: Country studies. *Acta Silvatica & Lignaria Hungarica*. Special Edition 2005:485-508.
- Mendes, A.M.S. and Feliciano, D., 2005. Portugal. Country report. In: Jáger, L. (ed.), 2005. Forest sector entrepreneurship in Europe: Country studies. *Acta Silvatica & Lignaria Hungarica*. Special Edition 2005:555-642.
- North, D., 1990. *Institutions, institutional change and economic performance*, Cambridge University Press. 152 p.
- Aarne, M., Hänninen, R., Kallio, M., Kärnä, J., Karppinen, H., Ollonqvist, P., Packalen, K., Rimmler, T., Toppinen, A., Kajanus, M., Matilainen, A., Rutanen, J., Kurki, S., Peltoniemi, J. and Saarinen, J., 2005. Finland. Country Report. In: Jáger, L. (ed.), 2005. Forest sector entrepreneurship in Europe: Country studies. *Acta Silvatica & Lignaria Hungarica*. Special Edition 2005:171-244.
- Petennella, D., Klön, S., Brun, F., Carbone, L., Venzi, L., Cesaro, L. and Ciccarese, L., 2005. Italy. Country Report. In: Jáger, L. (ed.), 2005. Forest sector entrepreneurship in Europe: Country studies. *Acta Silvatica & Lignaria Hungarica*. Special Edition 2005:383-435.
- Rametsteiner, E., Aldrian, A., Bauer, A., Eberl, W., Sekot, W., Wagner, S. and Weiss, G., 2005. Austria. Country Report. In: Jáger, L. (ed.), 2005. Forest sector entrepreneurship in Europe: Country studies. *Acta Silvatica & Lignaria Hungarica*. Special Edition 2005:17-70.
- Schlager, E. and Ostrom, E., 1992. Property rights regimes and natural resources: a conceptual analysis. *Land Economics* 68(3):249-262.
- Slee, B., Ingram, J., Cooper, R., Martin, S. and Wong, J., 2005. United Kingdom. Country Report. In: Jáger, L. (ed.), 2005. Forest sector entrepreneurship in Europe: Country studies. *Acta Silvatica & Lignaria Hungarica*. Special Edition 2005:725-776.
- Vail, D. and Hultkrantz, L., 2000. Property rights and sustainable nature tourism: adaptation and mal-adaptation in Dalarna (Sweden) and Maine (USA), *Ecological Economics* 35:223-242.

THE VALUES AND OBJECTIVES OF PRIVATE FOREST OWNERS AND THEIR INFLUENCE ON FORESTRY BEHAVIOUR: THE IMPLICATIONS FOR ENTREPRENEURSHIP

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SUMMARY

It has been assumed in many empirical studies of non-industrial private forest owners (NIPF) that their objectives for their forests are the most important factor influencing the management decisions they make and their actions within their forests. Consequently it can be hypothesised that the objectives of forest owners influence whether they engage in entrepreneurial activity. The aim of this paper was to test this hypothesis by undertaking a review of studies concerning private forest owners' values, attitudes and behaviour. The results of this review were that many typologies of forest owners have been developed based on their objectives. The typologies typically divide forest owners into two main groups, i.e. one group whose primary objective for their forests is associated with production (of wood and non-wood goods and services) usually, although not exclusively, with the objective of generating economic activity and a second group whose primary objective is consumption (of wood and non-wood goods and services). This latter group is often then further subdivided. Few of the studies reviewed specifically address the link between the objectives and the actual behaviour of the owner or their entrepreneurial activity. The paper concludes by hypothesising links between entrepreneurship and owners' objectives and identifies the need for further research in Europe in this area.

1. INTRODUCTION

Private forest management is primarily a voluntary action with few legal constraints in many countries. The exceptions include Central and Eastern European post-communist countries where forest management is strongly regulated by different rules and laws and countries where receipt of financial assistance for afforestation requires compliance with regulations. In most other countries, aside from the potential requirement to reforest after final felling, forest owners can largely decide which management activities they pursue in their forests. The characteristics of the forest holding and the financial position of the owner play a role in this decision-making. However, forest owners' attitudes towards forestry and their objectives concerning their forest property are perhaps the most important factors affecting the management decisions. This is an underlying assumption in many empirical studies on non-industrial private forest owners' (NIPF) forest management behaviour. This assumption has often been implicit, rather than being explicitly based on direct measurements of factors motivating this behaviour. Demographic characteristics, such as income or occupation, are often used as proxies of owners' attitudes or preferences. Even when attitudes or "reasons for owning forest land" have been explicitly measured, the analysis of their effects on actual behaviour has often been descriptive or non-existent.

Private forest management behaviour is basically volitional. Knowledge of forest owners' values, attitudes and ownership objectives is therefore of crucial importance in understanding and predicting forestry behaviour in private woodlots. This kind of knowledge should be available to policy-makers to ensure that effective and efficient forest policy instruments are designed.

The behaviour (or resultant actions) of forest owners is a key factor influencing the competitiveness of the forest wood/non-wood chain. Indeed, such behaviour influences whether such a chain even exists. Thus in the context of the objectives of COST E30 it is important to explore whether the values and objectives of forest owners influence forestry behaviour from the point of view of entrepreneurship. The aim of this paper therefore is to test this hypothesis by undertaking a review of studies concerning private forest owners' values, attitudes and ownership objectives. The paper describes the values and objectives of forest owners and the influence of these factors on forestry behaviour from the point of view of entrepreneurship. It does so by exploring the research that has been carried out on the objectives of forest

owners to establish whether there is evidence that these objectives and attitudes act as barriers to or facilitate entrepreneurship. Specifically, it examines forest owner typologies. Boon et al. (2004) state that “typologies simplify and organize complex reality, they describe patterns but they do not describe individuals”. They can be based on theoretical assumptions or on empirical evidence in the form of quantitative and qualitative data (ibid).

2. LITERATURE REVIEW

The typologies found in the meta-analysis of the literature were obviously influenced by the objective of the research that they were derived from. In some cases the research objective was quite specific. For example, the typologies outlined by Kline et al. (2000) were developed to identify forest owners’ willingness to accept incentive payments to forego harvesting in order to improve wildlife habitat. Yet despite the different research objectives many of the typologies developed were similar. Thus in the analysis that follows, common types of owners that emerged through the literature review are described. The typologies that specifically link to the behaviour of the owners are then described in detail.

Typologies of forest owners based on objectives and values

At a basic level most typologies divide forest owners into two main groups, i.e. one group whose primary objective for their forests is associated with production (of wood and non-wood goods and services) usually, although not exclusively, with the objective of generating economic activity and a second group whose primary objective is consumption (of wood and non-wood goods and services). This latter group is often then further subdivided (Table 1).

Primary motivation production

Kurtz and Lewis (1981) developed a typology of forest owners in eastern USA based on their motivations and objectives. One of the four groups of owners identified by them was the *timber agriculturist* who was described as growing and harvesting timber in a sustained manner. This group was portrayed as business-oriented and attempting to maximize the financial return from timber. Similarly, Marty et al. (1988) identified one cluster of forest owners in Missouri as *timber agriculturists*. These were described as business-oriented owners who felt that trees can be managed similarly to agricultural crops to return a profit. Kline et al. (2000) also identified a group of American forest owners as *timber producers* who stress timber production and land

investment considerations. In Lithuania, Mizaraite and Mizaras (2005) classified one group of forest owners they surveyed as *businessmen* whose objectives were to earn income from sales of wood and non-wood products.

Some typologies separate the timber production goal from the economic goal. For example, Lönnstedt (1997) identified a group of forest owners in Sweden with *formal economic goals* whose aims were to attain a positive cash flow. The use of profits to facilitate investment in equipment, forest roads and property expansion were also considered important by this group. A separate group with *informal economic goals* was also identified. This latter group emphasised profit-making related to profits earned from hunting and the provision of firewood. Lönnstedt (1997) distinguished both these groups with economic goals from a group he identified as having *production goals*. The aim of forest owners with production goals was to increase the standing volume, cuttings and the level of increment in their woods. In a later study of Swedish forest owners, Hugosson and Ingemarson (2004) also differentiated between those with *production motivations* which comprised the production of wood and its harvesting for sale (as well as for domestic consumption) and those with *economic efficiency goals*. This latter group of forest owners had economic objectives for managing their forests. Karpinen (1998, 2000) described *investors* as forest owners who regarded their forest property as an asset and a source of economic security, such as security against inflation and old age. The same author also identified a group of owners classified as *self-employed* who valued regular sales and labor income from delivery sales (the seller does the logging and hauling), as well as employment provided by their forests. They also stressed the importance of household timber. In their survey of German forest owners Von Mutz et al. (2002) found a group they labeled *economically oriented owners*. These used their forests as a source of immediate income for consumption and a source of economic security.

Some forest owner types could be equally assigned to the group with production goals or to those classed as having multiple objectives (see below). For example, the *classic forest owner* described by Boon et al. (2004) placed greatest emphasis on the importance of forest income generation. However, they also valued the environmental and recreational aspects of forest ownership, and attached importance to the forest as a legacy.

Table 1. Examples of forest owner types.

| Study | Production goals | | Consumption | | |
|--|---|--|---|--|--|
| | Production of wood | Non-timber | Multiple objectives | Indifference | |
| Kline et al. 2000 | Timber producer-stress timber production and land investment | Recreationist – value recreation and enjoyment of green space | Multi-objective - emphasise economic benefits, non-timber benefits and personal gratification equally | Passive – underline owner gratification – enjoyment of owning the forest most important | |
| Mizaraitė and Mizaras 2005 n=415 | Businessman - earn income from sales of wood and non-wood products 29 % | Ecologist – value nature conservation 18 % | Multi-objective – hold multiple objectives 31 % | | |
| Wiersum et al. 2005 n=1401 | Consumer – main motivation is the extraction of wood and non-wood products for personal use 22 % | Environmentalist – place priority on nature and landscape 30 % | Multi-functional -attach equal priority to economy, nature and landscape 17 % | Indifferent - a low level of motivation concerning all forest functions 37 % | |
| Karppinen 1998; 2000 n=245 | Investor – regard their forest as a source of economic security 13 % Self-employed – value income from regular sales 30 % | Recreationist – emphasise amenity and recreation values 31 % | Multi-objective -values equally monetary benefits and amenity 26 % | | |
| Boon et al. 2004 n=1220 | Classic forest owner - greatest emphasis on income generation 52 % | Hobby owner – forest used for hobby activities; value aesthetic and biodiversity 30 % | Multi-objective – motivated by financial, environmental and other values 18 % | | |

Primary motivation consumption

A number of forest owner types whose primary objective is consumption have been identified. These generally range from those whose primary objective is the production of wood and non-wood products for their own use to those who either have multiple objectives or no explicit objectives for their woods.

Consumption goals

A number of typologies have identified a specific type of forest owner whose objective is the production of wood and other products for their own use. For example, Mizaraitė and Mizaras (2005) identified the *consumer* group of forest owners in Lithuania whose main motivation for forest ownership is the extraction of wood and non-wood products for personal use and for whom the collection of fuel wood is very important. Wiersum et al. (2005) in their study of forest owners in Austria, Denmark, Germany, Greece, Hungary, Ireland, Netherlands and Spain, found a type they described as *self-interested forest owners* who use the forest mostly for providing products for their own use.

Non-timber goals

A type of forest owner, described as a *forest environmentalist*, was identified by Kurtz and Lewis (1981). These were owners whose primary objective for their forest was the generation of non-timber outputs such as aesthetic values, wildlife and privacy. Marty et al. (1988) used a similar term to describe a group of forest owners in Missouri who were primarily concerned with the non-tangible benefits from their forest. The same authors classed a further group of forest owners as *forest recreationists*. These were people who owned forestland primarily for recreation and enjoyment. A similar group of forest owners was also identified in Finland by Karppinen (1998, 2000). This group, also referred to as *recreationists*, emphasized the non-timber and amenity aspects of their forest ownership including outdoor recreation, aesthetic considerations and berry-picking. Forest owners in the USA, who were classed as *recreationists* by Kline et al. (2000), valued the non-timber objectives of forest ownership, such as recreation and enjoyment of green space, and to some extent, stressed bequest motives. In Lithuania, a forest owner type known as an *ecologist*, valued nature conservation highly (Mizaraitė and Mizaras, 2005). Hugosson and Ingemarson (2004) identified a group of Swedish forest owners with *conservation* objectives. These emphasized the protective function of forests. Biodiversity and forest landscape management were also key objectives of these owners. In the same country, Lönnstedt (1997)

described a type of forest owner with *environmental goals*, who particularly stressed the aesthetic aspects of their forests. Wiersum et al. (2005) also found a forest owner type they called *environmentalists* who placed priority on nature and landscape.

Another group of owners who can be categorized as having non-timber goals are those with amenity objectives. Hugosson and Ingemarson (2004) outline how this group stressed the intangible aspects of forest ownership. Emotional ties to the forest estate and social contacts with relatives, friends and foresters and other forest owners can be of importance for this group of forest owners. Similarly Lönnstedt (1997) described Swedish forest owners (some of whom resided on the holding and some of whom were absentee owners) with *intangible goals* as those who wished for a certain lifestyle from the forest such as the opportunity (for the absentee owners) to meet neighbours during the hunting season. Boon et al. (2004) used the term *hobby owners* to describe those who attached importance to the forest as a place for hobby activities and who valued the aesthetic and biodiversity aspects of forests. Forest owners who consider their forest mainly as a place for outdoor recreation or hunting or as an object of nature conservation were labeled *leisure-oriented owners* by von Mutz et al. (2002).

Multiple objectives

Many forest owners have been classified as multi-objective in typologies. In their overview of typologies, Boon et al. (2004) describe the *multi-objective* owner as one motivated by financial considerations as well as recreational, environmental and other values related to forest ownership. Marty et al. (1988) found a similar group of forest owners in Wisconsin whom they labeled as *forest utilitarians*. This group held forestland for a variety of purposes with no dominating philosophy. They do not manage their forest for sustained timber production and instead use the forest resource to satisfy immediate needs such as fuel wood, grazing, recreation and residence. The same authors class as *timber conservationists* forest owners in Missouri who manage their forests for the sustained production of timber crops and who have a long-term stewardship perspective and a concern for wildlife. One of the types of forest owner that Karppinen (1998; 2000) found in Finland was the *multi-objective owner* who valued equally both the short-term and long-term monetary benefits as well as the amenity benefits of their forests.

Kline et al. (2000) characterized the group of forest owners they identified as *multi-objective* as those who emphasise economic benefits, non-timber benefits and

personal gratification equally. In their study of forest owners Wiersum et al. (2005) described the *multifunctional forest owner* as one who attaches equal priority to economy, nature and landscape. *Multi-objective owners* have also been identified in Lithuania (Mizaraite and Mizaras, 2005).

Indifference or passivism

The final group of forest owners is often referred to as passive owners or indifferent owners. Wiersum et al. (2005) found that among the forest owners they surveyed in eight European countries, the largest group was classed as *indifferent*. These have a low level of motivation concerning all the forest functions. *Passive owners* is the term used by Kline et al. (2000) to describe forest owners whose primary benefit derives from the simple enjoyment of owning land.

3. HOW DO OBJECTIVES INFLUENCE FOREST OWNERS' BEHAVIOUR?

Few of the studies undertaken on typologies specifically addressed the link between the objectives and values of the forest owner and their actual forestry behaviour. Those that did focused on forestry behaviour in the context of forest management from a timber production point of view. There was little evidence of an examination of forestry behaviour relating to the production of non-wood products and services. Marty et al. (1988) did look at the forest management behaviour of forest owners but limited their investigation to timber production type activities. Thus timber stand improvement, reforestation (planting or seeding), completion of timber inventories, and harvesting timber were the activities investigated in their study. They found that timber stand improvement was the management practice most frequently used by timber agriculturalists in Missouri and resource conservationists in Wisconsin. Reforestation activities were common in the forests of resource conservationists in Wisconsin. The completion of timber inventories was also most common among timber-oriented owners, i.e. timber agriculturalists and resource conservationists. Timber was harvested, as expected, most commonly by timber-oriented owners in both regions, i.e. timber agriculturalists and resource conservationists. Interestingly, forest environmentalists in Missouri did not seem to ignore timber harvesting completely.

A link was established between landowner objectives, owner and holding characteristics, as well as harvesting and silvicultural behaviour by Karppinen (1998). The forest owner groups based on their objectives were identified by owner and holding characteristics using logit-models. Silvicultural and harvesting behaviour

was also analyzed in these groups (Karpinen 1998). Besides descriptive analyses, dummy variables indicating assignments to these groups were included in an econometric timber supply function along with other explanatory factors to investigate the effects of ownership objectives on timber sales (Kuuluvainen et al. 1996). The timber sales of NIPF owners were connected to their objectives: multi-objective owners harvested significantly more than the other three groups. Knowledge of forest owners' assignment to the groups based on ownership objectives was similarly incorporated in the models when analyzing forest owners' reforestation behavior. The results suggested that ownership objectives explained seeding, planting and seedling stand improvement activities (Hänninen et al. 2001). Categorising forest owners as investors affected positively their seeding and planting activity, and self-employed owners were more active in seedling stand improvement. Ovaskainen et al. (2006) studied factors affecting timber stand improvements. They found out, interestingly, that owners emphasising amenity values were more active in their timber stand improvements.

4. ENTREPRENEURSHIP

In the analysis of the literature very little was found that directly related to the entrepreneurial attitudes of private forest owners. Only Lunnan et al. (2005) considered this topic, although their study does not specifically link these attitudes to the values and objectives of forest owners for their forests. In their study of entrepreneurial attitudes and the probability of start-ups among private forest owners in southern Norway, entrepreneurship theory was used to determine why some farm forest owners choose to start up new activities based on the forest resources they have.

A postal survey was carried out in 2002 during which a questionnaire was sent to 500 owners of whom 45 % responded. The sample was drawn at random from the membership list of a forest owners' association in southern Norway. Two indicators, which were considered important in influencing whether forest owners start a new activity or not were considered; namely risk aversion and opportunity recognition. The questionnaire included questions relating to the attitudes of the owners towards entrepreneurship; their opinion on the favourability of opportunities in forestry and their willingness to take risks when looking for opportunities.

The owners were also asked whether they were thinking of offering new services and products to increase their income and whether they had realised a new start-up.

The results indicated that 25 % of those surveyed had experiences with new business activities (including commercialisation of hunting and fishing and renting out cabins). However, only one third of these new business activities had a basis in forestry alone, while a further one third had a basis in both forestry and farming. Logistic regression was used to determine which factors influenced whether a forest owner would start up a new business. Those variables shown to significantly influence this occurrence were “willingness to take a certain risk when looking for business opportunities” and “looking for profitable business opportunities in the forestry sector”.

5. DISCUSSION

The aim of this meta-analysis of the literature was to test the hypothesis that the values and objectives of forest owners influence forestry behaviour from the point of view of entrepreneurship. However, from the literature examined, it is not possible to test the veracity of this hypothesis. What the literature has shown is that it is a tacit assumption of the studies that goals and objectives do influence behaviour, but very few actually assess whether this is case. The small number of studies that did address this issue did not throw up any surprising results. As expected, with few exceptions (e.g. Kuuluvainen et al. 1996), forest owners whose objective was timber production and who were business-oriented were more likely to manage and harvest their stands. These studies were focussed on timber management and production behaviour and did not consider behaviour in the context of other activities in forests. Yet, as demand for these non-timber production activities (e.g. foliage production, nature-based tourism, non-wood products) increases, it is in these areas that entrepreneurial activity will be required.

So in the absence of literature specifically addressing the issue of concern, this final section of the paper will outline possible links between owner objectives and entrepreneurial activity. The assumption is made that income generation is one of the main drivers to entrepreneurial start-ups in forests or farms. The forest owner types are revisited and the link between the objectives of these owners and entrepreneurial activity hypothesized.

Production goals

Research has shown that this group of forest owners is most likely to engage in active forest management. Thus, entrepreneurial activity that relates to timber production might be most likely among this group. Many of those with timber production goals

are also motivated by economic concerns, thus increasing the likelihood that they will engage in activities that can be shown to increase the financial return from their forest enterprise. The types of activities could range from basic wood production activities (e.g. selling roundwood, getting involved in logging and hauling) to setting up small-scale sawmills.

Consumption goals

Although this group of forest owners is mainly using their forest products and services for domestic use, there may be potential also for entrepreneurial activities connected to forests. For instance, excessive fuelwood may be sold to neighbours and other customers. Similarly, berries and mushrooms could be sold on local markets.

Recreation goals

The objective of this group for their forest is amenity and recreation (for self and family). Thus it is hypothesised that, on the basis of their objectives, it is unlikely that this group would get involved in entrepreneurial activity. The basis for this is that the economic return from the forest is not emphasised, so the typical motivation for entrepreneurial activity is absent.

Multiple objectives

It could be argued that the multi-objective group of owners are quite likely to get involved in entrepreneurial activity. Not only are financial motivations important to this group but they also recognise and appreciate the variety of products and services that their forests supply. Thus they should be aware of the forest-related activities that entrepreneurial activity could be based on. There is evidence from the literature that this group (Kuuluvainen et al. 1996) harvest more than other groups. Thus the holding of multiple objectives does not appear to hinder their involvement in timber production. This group may also get involved in entrepreneurial activity related to game management and hunting.

Indifference

This group is quite interesting and may offer possibilities for entrepreneurship. It seems unlikely given their lack of involvement in their forest that they might directly get involved in entrepreneurial activities but there may be an opportunity for others to make use of their forests for entrepreneurial activity. An example of this might be foliage production for which there is an increasing demand (c.f. renting of fields). There are examples of this in Ireland where a foliage company leases the forest,

undertakes all the work while the owner benefits financially. These owners could also be interested in biodiversity protection if they got subsidies.

6. CONCLUSION

There is an urgent need to undertake a survey of forest owners in Europe. Such a survey would not only help test the hypotheses outlined above but a Europe-wide survey using a common methodology would quantify the relative frequency of each type of forest owner.

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REFERENCES

- Boon, T.E., Meilby, H. and Thorsen, B.J., 2004. An empirically based typology of private forest owners in Denmark: improving communication between authorities and owners. *Scandinavian Journal of Forest Research* 19(Suppl. 4):45-55.
- Hänninen, H., Karppinen, H., Ovaskainen, V. and Ripatti, P., 2001. Metsänomistajan uudistamiskäyttäytyminen. [Forest owners' reforestation behavior] *Metsätieteen aikakauskirja* 4/2001:615-629. In Finnish.
- Hugosson, M. and Ingermarson, F., 2004. Objectives and motivations of small-scale forest owners; modelling and qualitative assessment. *Silva Fennica* 38(2):271-231.
- Karppinen, H., 1998. Values and objectives of non-industrial private forest owners in Finland. *Silva Fennica* 32(1):43-59.
- Karppinen, H., 2000. Forest values and the objectives of forest ownership (doctoral dissertation). *Metsäntutkimuslaitoksen tiedonantoja* [Finnish Forest Research Institute, Research Papers] 757. 55 p. + 4 articles
- Kline, J.D., Alig, R.J. and Johnson, R.L., 2000. Fostering the production of non-timber services among forest owners with heterogeneous objectives. *Forest Science* 46(2):302-311.
- Kuuluvainen, J., Karppinen, H. and Ovaskainen, V., 1996. Landowner objectives and non-industrial private timber supply. *Forest Science* 42(3):300-309.
- Kurtz, B.W. and Lewis, B.J., 1981. Decision-making framework for non-industrial private forest owners: an application in the Missouri Ozarks. *Journal of Forestry* 79(5):285-288.
- Lönnstedt, L., 1997. Non-industrial private forest owners' decision process: A qualitative study about goals, time perspective, opportunities and alternatives. *Scandinavian Journal of Forest Research* 12:302-310.
- Lunnan, A., Nybakk, E. and Vennessland, B., 2005. Entrepreneurial attitudes and probability for start-ups – an investigation of Norwegian non-industrial private forest owners. *Forest Policy and Economics*, in press.

- Marty, T.D., Kurtz, W.B. and Gramann, J.H., 1988. PNIF owner attitudes in the Midwest: A case study in Missouri and Wisconsin. *Northern Journal of Applied Forestry* 5(3):194-197.
- Mizaraitė, D. and Mizaraš, S., 2005. The formation of small-scale forestry in countries with economy in transition: observations from Lithuania. *Small-scale Forest Economics, Management and Policy* 4(4): 437-450.
- Ovaskainen, V., Hänninen, H., Mikkola, J and Lehtonen, E., 2006. Cost-sharing and private timber stand improvements: a two-step estimation approach. *Forest Science* 52(1):44-54.
- Von Mutz, R., Borchers, J., Becker, G., 2002. Forstliches engagement und forstliches engagementspotenzial von privatwaldbesitzern in nordrhein-westfalen – analyse auf der basis des mixed-rasch-modells. *Forstw.Cbl.* 121:35-48.
- Wiersum, K.F., Elands, B.H.M. and Hoogstra, M.A., 2005. Small-scale forest ownership across Europe: characteristics and future potential. *Small-scale Forest Economics, Management and Policy* 4(1):1-19.

FOREST OWNERS' ORGANIZATIONS ACROSS EUROPE: SIMILARITIES AND DIFFERENCES

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SUMMARY

This paper reports the results from the case-studies of Subgroup “Forestry Associations” in Working Group 1 of COST Action E30 “Economic integration of urban consumers’ demand and rural forestry production”. The main purpose of this paper is to identify similarities and differences of forest owners’ organizations in a group of countries from Northern, Central and Southern Europe, with very different histories in this matter, in order to come up to some exploratory hypotheses about the supporting and impeding factors of the dynamics of these organizations, throughout their lifetime. The paper should be seen as a first step in the identification of an adequate theoretical framework to explain this dynamics, with no attempt yet to empirical test any hypotheses. The most striking differences are found with regard to the length of the history of forest owners associations, ranging from the long-lasting history of associations in Norway, Finland, Germany and Italy to the relatively short histories in Portugal, Ireland and in most of the East-European countries. By looking at these differences and also at some broad similarities, the main conclusion drawn from these case studies is that an appropriate theoretical framework to analyze the supporting and impeding factors of forest owners’ associations start up and development is one that should combine two kinds of rationalities: “constructivist rationality” which takes into account the role of efficiency factors, and “ecological rationality” which takes into account the role of social norms and political factors.

1. INTRODUCTION

As stated in the Memorandum of Understanding of COST Action E30, *“The main objective of the Action is to gain better understanding on the problems and possible solutions in forest based entrepreneurship leading to improved employment and income in rural areas at the European level. These include: (a) problems and solutions for economically integrated forestry-wood processing chains, which connect small-scale forestry production into local wood processing and further to urban consumer markets; and (b) problems and solutions for integrating the demand of urban consumers on non-wood forest products and services together with their respective rural supply.”*

Left on their own, in rural towns near their forests, or in urban areas, far away from their forests, small scale forest owners have a hard time to contribute to the “integration of forestry-wood processing chains” and “to connect to urban consumer markets” of wood and non-wood forest products. Their organization in forest owners' associations is a form of collective entrepreneurship enabling them to act in those directions. So by looking at how these organizations started up, in different countries around Europe, and analyzing the supporting and impeding factors of their development, this paper is at the very heart of the main issue addressed in the COST Action E30: **the identification of the barriers and facilitators of competitiveness of the forestry-forest products consumer chain, from the point of view of entrepreneurship.**

2. THEORETICAL BACKGROUND

2.1. Constructivist rationality approach

Efficiency motives for organizational capacity building

In the wide field of theories dealing with the start up and development of organizations, one broad dividing line that can be drawn is between those adopting a “constructivist rationality” concept and those based on an “ecologic rationality” concept (Smith 2003). The constructivist approach looks at organizational capacity building mainly as the outcomes of “conscious deductive processes of human reason ... [those outcomes being] deemed preferable, given particular circumstances, to those produced by alternative arrangements” (Smith 2003, pp. 467-468). One important version of this approach includes the theories explaining organizational start up and development as driven by economic efficiency reasons (North 1990): Economic agents tend to act collectively when the additional benefits they can share by doing so outweigh the corresponding additional benefits, compared to the situation where they act on their

own. In the case of forest owners' associations a list of possible gains of this kind includes the following:

- Economies of scale in forest management and timber sales: In many West-European countries not only the distribution of forest ownership is very fragmented, but also each holding is fragmented in several scattered plots. In Eastern Europe, however, much of the land is still owned by the state, but the transitions from state owned to privately owned properties is in progress and the number of small-scale forest owners will grow significantly in the years to come. One efficiency reason driving the establishment of forest owners' organizations is therefore to take advantage of the economies of scale that may exist by scaling up the size of the forest management operations and timber sales.
- Rural outmigration: Forest owners' are less and less farmers or rural dwellers and more and more urban. For this kind of owners it may be a better option to delegate fully, or partially, the management of their forests to some local organization, than to take care of that job themselves. This will cost them less in money and time, with greater benefits.
- Imperfections in forest products markets: As concentration increases in the buyers' side, there is an incentive for forest owners also to concentrate their marketing operations in order to improve their bargaining power. Up to a certain point, for buyers this is not necessarily unfavourable since it reduces their transaction costs in procurement.
- Certification of forest management: Certification in these markets, in economic terms, is a club good for the forest owners who get their forest products certified. This is a further incentive for them to get collectively organized in such a way that they can have that kind of service delivered to their products.
- Externalities involved in forest management: Improved forest management is a concern involving not only interactions among forest owners themselves, but also with the rest of the society. Important examples of these interactions can be both negative externalities (i.e., forest fires in Southern Europe) and positive externalities with a public goods nature (i.e., biodiversity and landscape conservation). The internalization of these externalities again calls for some form of collective organization of the forest owners.

- Relations between forest owners and public policy: In most countries the range of public policies to which forest owners have to respond is very wide and often very complex, beyond the capacity they have to devote to these matters. The transaction costs they have to bear to deal with these issues may be too high. The availability of a mediator representing well their interests in these relations with the public administration and take care of all the corresponding red tape can be very useful to reduce those transaction costs.
- Capacity for innovation: The need to diversify the range of marketable forest products beyond timber and other traditional forest goods is becoming more and more important if one is seeking for an economically viable forestry. Therefore, forest owners are facing an increasing need of technical and marketing support for this kind of innovation in products and processes.

Inspired by this approach, in the country cases covered in this paper we will look for the existence of this kind of motives in the start up and development of forest owners' associations.

Limitations of the efficiency motives for organizational capacity building

One of the major limitations of efficiency motives for organizational capacity building is that these motives have to do with "common interests" of the actual and potential members of the organization which have to live together with their individual interests: "common to a group means that no one in the group is excluded from the benefit or satisfaction brought about by its achievement" (Olson 1971). This means that the "common interests" pursued by an organization are non rival goods or services for its members. These goods and services can have benefits which go almost entirely to those who join the organization (for example, the benefits of certification). However, in the case of forestry, these and other services delivered by a forest owners' association have, almost all the time, major positive externalities benefiting the whole society, even when this society did not pay for that. So, by pursuing the "common interests" of their members, forest owners' associations are also delivering public goods (with non rivalry in their consumption and non exclusion in the access to their consumption).

This type of output tends to be predominant at the start up and during the early stages of these associations when they emerge in contexts of poorly managed and individually scattered private forestry, the initial tasks being essentially to group these small forest owners for operations of improved forest management.

Since the delivery of public goods tends to be heavily involved at the start up of these organization, this start up may be constrained by free rider problems. There are several ways to cope with these problems:

- **“Triggering factor”** (Waddock 1991). There may be a state of crisis or a major change in the economic and political environment of forest owners (structural changes in the markets for forest products, in forest policy, and landownership laws, etc.) which require responses from their side which are well beyond their capacity for acting alone, but which can be handled by acting collectively.
- **“Selective incentives”** (Olson 1971). An organization may be structured in such a way that it is able to provide jointly with its public goods, some private goods which can be allocated on a individual basis, as positive incentives, to those who join the organization and contribute to the common interests of the group, and as negative incentives, to those who defect from doing so.
- **“Critical mass”** (Marwell and Oliver 1993). “Critical mass” here is that level of provision of a public good where it has received enough interests and resources from its contributors that its provision becomes self-sustained by these voluntary contributions. The attainment of this critical depends on several factors, three main ones being the shape of the production function of the public (or club) good, the degree of heterogeneity within the potential and actual group members and the type of correlation between resources and interests for each member. If the production function has increasing marginal returns for lower levels of group membership there is a start up problem: each contribution yields a low return. However, if within the potential group members there are some with many resources and a high interest in the public good, they may be willing to be the initial contributors, hoping that others will join latter. Since there are increasing marginal returns, there may be a snow ball effect, each additional contribution by a new member raising the marginal returns for the next ones.

In the case of forestry, there are two relevant examples which may fit in this “critical mass” approach. One is the case where there are substantial technological externalities among forest owners, such as, for example, those related to forest fires. The marginal returns of joining a collective effort to reduce the risk of forest fires are increasing.

Another example refers to pecuniary externalities. The marginal returns of joining a collective effort to group sales of forest products may be increasing, in some cases.

The examples of ways to overcome the free rider problems involved in organizational start up and development may not be enough to achieve this outcome without public intervention. This intervention can take different forms, but we will retain here two of them:

- **Coercion.** Public authorities willing to promote the collective organization of forest owners may adopt legislation which directly imposes on them this kind of obligation. Another way to do this is to impose some kind of duties on the forest owners whose fulfilment forces them to get collectively organized.
- **Financial and other kinds of incentives.** Instead of a command and control approach, public authorities may use incentives (financial, in kind or others) to lower the private costs and raise the benefits of membership to a forest owners' association.

2.2. Ecological rationality approach

Ecological rationality is "an alternative and perhaps complimentary explanation" (Smith 2003, p. 467) to institutional capacity building. According to this approach "people may use socially-grown norms of trust and reciprocity ... to achieve cooperative states superior to individually rational defection outcomes" (Smith 2003, p. 467). Therefore, this approach, gives a high importance to cultural, political and other social-norm building factors in the start up and development of institutions.

The kind of hypothesis that comes out straight from this approach is that a cultural and political environment with good traditions of favouring free cooperation among people is also more favourable to the start up and development of forest owners' associations. The range of countries covered in this paper is diverse enough, on this count, to examine the likelihood of this hypothesis.

3. RESULTS FROM THE COUNTRY STUDIES

3.1. Similarities and differences concerning forest landownership

Table 1 summarizes the percentage of forest land owned or managed by private agents in the set of countries covered in this paper.

Table 1. Percentage of forest land under private ownership and/or management.

| Country | Total area of forests ^a ha | Structure ^b | Forests under private ownership and/or management ^b | |
|----------------------|--|---|--|------|
| | | | ha | % |
| Norway | 7 012 000 | - Average size: 57 ha. - 57.7% of holdings < 25 ha. - Farm-forests: 38 %. | 5 926 000 | 84,5 |
| Finland | 26 277 000 | - Average NIPF holding: 26 ha. - 63 % of holdings > 20 ha. - 80 % wage earners, pensioners and entrepreneurs. | 16 068 000 | 61,1 |
| Germany ^c | 11 076 000 (in 2005) | - Main occupation in agriculture (West-Germany: 14-48 %). | 5 206 000 | 47,0 |
| Ireland | 680 330 | - Average size of private holdings: 10.6 ha. - 88.8 % of holdings < 20 ha. - Approximately 61 % of the forest area planted post - 1990 was by full time farmers. | 282 970 | 41,6 |
| Italy ^d | 6 855 000 | - Average size of private holdings: 7.51 ha. - 16.54 % of forest total area is < 20 ha corresponding to 87.48 % of the holdings. - Most of the private forest small holdings are no longer attended and the owners are not traceable. | 4 114 000 | 60,0 |
| Poland ^e | 8 973 000 (in 2004) | - Average of private holdings: 1.3 ha. - 99.8 % of holdings < 20 ha. - The private forest owners are in vast majority also farm owners. - Total share of the forest owners living in towns reached about 30 % of private forests area. | 1 573 000 | 17,5 |
| Hungary | 1 836 000 | - In 2002, 59 % of forest land were state forest, 40% private forests and 1 % community property. | 734 400 | 40,0 |
| Romania | 6 367 000 | - In 2004: 68 % State forests, managed by the National Forest Administration, 12.5 % Communal forests and forests of municipalities; 10.6 % Private forests of individuals; 7.8 % Forest communities (composesorate), indivisible form of ownership; 1.1 %. Forests of churches and educational institutions. | 676 019 | 10,6 |
| Portugal | 3 349 000 ^f (in 1995) | - In 1995 ^g : 96 % of the number of holdings and 29 % of the forest land < 20 ha. - Regional differentiations in landownership structures: predominately small scale forestry in North and Central Portugal; large scale forestry in South Portugal. - Medium sized forest holdings (10-50 ha) are a non negligible group in the regions of small scale forestry (20-30 % of the forest land). - In 1995 ^h : 93.4 % private holdings, 5.4 % communal holdings, 1.2 % state holdings. | 3 129 000 ^h | 93,4 |

^a These areas are according to national definitions. ^b With the exception of Portugal, this data refers to ownership distributions. In the case of Portugal, the data refers to management units distribution. ^c Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft (2005) Die zweite Bundeswaldinventur - BWI. Bonn. ^d ISTAT (2001). ^e Central Statistical Office. ^f DGF (2001). ^g INE (1997). ^h Mendes et al. (2004).

There is a wide spectrum of situations, in terms of the salience of private forestry. This is ranging from the lower, but rising levels of some of the countries with economies in transition, or where afforestation is a relatively recent phenomenon (Ireland), to the very high levels of Scandinavian countries and Portugal, where no major changes in forest ownership have taken place for quite a long time. In Germany and Italy communal forests have a significant relative position. One obvious implication from such a diversity of ownership and management structures is that the need for start up and development of forest owners' associations had also to be very different across the set of countries studied here. In brief, initial conditions in terms of forest land ownership matter as far as forest owners' associations' dynamics is concerned.

Another interesting issue concerning land ownership and the start up of forest owners' associations is the fact that this distribution is skewed: a small minority of forest owners controls most of the forest land, with medium size forest owners being also of some importance. Where fragmentation seems to be a more serious problem is at the operating unit level since forest ownership is often scattered through several plots not spatially contiguous. One interesting hypothesis to dig in future research is to see whether or not these medium sized forest estates, and even some of the larger ones, may have played a leading role in the start up of the forest owners' organizations, according to the "critical mass" theory of public goods provision. Some fragmented evidence available about forest owners' associations in Portugal points in this direction: medium sized forest owners were instrumental in the start up of a good number of these associations. However, to overcome the start up problem, they did so when their resources were combined with public financial incentives.

3.2. Similarities and differences concerning the triggering factors at the start up and the early developments

Table 2 summarize the information regarding the period and what the major drivers were for the start-up of forest owners' organizations.

Table 2. Start-up period and major drivers for forest owners' organizations.

| Country | Start-up | Major drivers |
|---------|-------------|--|
| Norway | Early 1900s | <ul style="list-style-type: none"> - Increasing market power of timber buyers. - Demand of information by the forest owners which could help them in the negotiations with timber buyers. - Delegation to forest owners' associations of the negotiations with timber buyers to gain market power and economies of scale in timber sales. |
| Finland | 1907 | <ul style="list-style-type: none"> - Increasing market power of timber buyers. - Demand of information by the forest owners which could help them in the negotiations with timber buyers. - Delegation to forest owners' associations of the negotiations with timber buyers to gain market power and economies of scale in timber sales. - Fear of the public authorities and other stakeholders of timber shortages and the need to support forest owners in the silvicultural operations necessary to cope with that threat. - Cooperative tradition in farming, at a time when most forest owners were also farmers. |
| Germany | 1920 | <ul style="list-style-type: none"> - Laws hastening the formation of forest cooperatives. |
| Ireland | 1980s | <ul style="list-style-type: none"> - Evolved from dairy co-operatives. - Technical support to the new forest owners. <ul style="list-style-type: none"> • preparing applications for public grants • hiring and supervising contractors for the installation and management of the new plantations |
| Italy | 1923 | <ul style="list-style-type: none"> - Consolidation of managerial efforts by public and private owners. - Design and implementation of forest management plants. Implementation of soil protection public works. |
| Poland | 2002 | <ul style="list-style-type: none"> - Transition to a democratic regime and a market economy. - To promote environmental protection and sustainable forest development. - Organizational support provided by the public administration (State Forest services, Ministry of Environment, local governments) and international organizations (PHARE programme and IUCN Poland). |
| Hungary | 1851 | <ul style="list-style-type: none"> - To represent the forest professionals and large forest owners' interests efficiently during the development of forestry acts. - Private forestry interests' representation interrupted from World War II until the transition to democracy and a market economy, in the 1990s. - Resurrection of private forestry's interests representation after the privatization process got started. |
| Romania | 1992 | <ul style="list-style-type: none"> - Transition to a democratic regime and a market economy. Since 1992: small associations to protect owners against timber robbery (15 % of forest owners were organised in this kind of cooperation in 1997). - Governmental Ordinance (96/1998) regulating the system of forest administration (forms of management aimed at imposing legal regulations on forests, especially on private ones). - 2000/2001: creation of associations of owners as compulsory legal entities established under the Law 1/2000, as a pre-requisite or the restitution of lands belonging to formers forest communities before nationalisation. - Representation of the interests of the private administrations in the policy making process. |

Table 2. Continued.

| Country | Start-up | Major drivers |
|----------|----------|--|
| Portugal | 1990s | <ul style="list-style-type: none"> - Establishment of a democratic regime in 1974. - Opening to international cooperation with countries with experience in forest owners' associations. - Crisis of the State Forest Services as an agency with strong capacities for direct intervention in forest management. - Due to intense rural outmigration during the 60s, 70s and 80s, coupled with agricultural technological change, there was increasing separation between farming and forestry. Increasing risk of forest fires, especially in the regions of small scale forestry. - Forestry programmes co-funded by EU (since 1987) providing financial incentives to private forest owners for afforestation and stand improvement. - Programmes co-funded by the EU (since 1987) for the start up of farmers' (not specifically forest owners) organizations to deliver technical assistance to their members. - Main types of technical assistance provided to the members: <ul style="list-style-type: none"> • preparing applications for public grants • hiring and supervising contractors for the installation and management of the new plantations |

There is a clear division between the Nordic countries, Germany, Hungary and Italy, compared to the other countries with respect to the start-up period. While most of the former established organizations in the first quarter of the 20th century or even in the 19th century, Ireland, Romania, Poland and Portugal got such establishments first in the 1990s and 2000s. In spite of this difference, there is a similarity: in all of these countries there seems to have been a triggering factor in forest owners' associations start up. The specificities of these factors, however, were very different in each country:

- a) Norway and Finland: buyers' concentration in the forest products' markets exercising market power on forest owners;
- b) Germany: laws hastening the formation of forest cooperatives;
- c) Hungary: development of forestry legislation in the 19th century;
- d) Italy: implementation of soil protection public works;
- e) Ireland and Portugal: availability of very generous public incentive programmes for private forestry;
- f) Romania: transition to democracy and market economy, with land restitution;
- g) Poland: transition to democracy and market economy.

The great dividing line in terms of date of start up seems to favour the "ecological rationality" approach to organizational take off. In fact, forest owners' associations started earlier in countries with a Nordic or Germanic culture, under democratic

political regimes and when socialist and communist ideologies were spreading in that part of the world. The start ups took much longer time to take off in countries with a Latin culture and where authoritarian regimes were in place.

The case of Ireland is special in the sense that it was a late comer to this process, in spite of having lived in democracy for a long time. However, also this case is favourable to the “ecological rationality” approach because a major driver of forest owners’ associations were the dairy cooperatives and the long and appreciated tradition of cooperation among farmers for technical advice supply services and marketing of farm products.

Italy also stands as a special case. The fact that the implementation of soil protection public works played a relevant role in the emergence of new institutions for forest management and the important position held by public forest owners, especially the municipalities, set this country in a special track in terms of associative movement. This movement tended to develop, mostly among forest workers employed in forest of large sizes, many of which are owned by municipalities.

This being said about the relevance of the “ecological rationality” approach, it seems that there is also some complimentary room for the “constructivist rationality” approach. In fact, in all the countries covered here forest owners’ associations came into being with missions aiming at some efficiency gains and purposive defence of common interests:

- Gaining market power in the sales of forest products
- Sharing the costs of technical advice provision
- Gaining scale in forest management operations
- Reducing negative externalities (forest fires), or promoting forest public goods and
- Gaining private forestry’s participation in the forest policy process.

In providing these services to their members, forest owners’ associations are delivering public (more positive forest externalities resulting from improved forest management) and club goods (technical public information, policy outcomes favourable to private forestry, etc.) jointly with private services (individual technical advice to members, forest management operations in the forest holdings of the members, timber sales services, etc.). These private services can be seen as “selective incentives” provided to the members, which enable these organizations to cope with free rider problems.

3.3. Similarities and differences concerning the development of forest owners' associations

In this section we are looking at the dynamic perspective and important developments and tasks during the emergence of forest owners' organization. This is summarized in Table 3.

Again, with respect to the development of forest owners' associations beyond their start up period, we find the same dividing line between Norway, Finland, Germany and Hungary, on one side, and Ireland, Romania and Portugal, on the other side. In the group of the first movers forest owners' organizations seem to have crossed a "critical mass" threshold, being in a situation where they are self-sustained in terms of the contributions from their members, and with a significant impact in forest management, marketing of forest products and participation in the forest policy process.

When the major triggering factor of the associative movement was the demand by forest owners of information relevant for their contracts with timber buyers, this helped these organizations to develop in the direction of having delegation from the forest owners to do those negotiations on their behalf, at a collective and larger scale. So in these cases forest owners' associations could move faster to marketing activities.

The ability to reach this stage where forest owners' associations could get involved in commercial activities (marketing of forest products, participation in forest industries) was important to achieve financial sustainability. However, in this group of countries public policies – supported or influenced by this kind of organizations – may also have played a role. They have been recognized stakeholders in the forest policy process and, therefore, their views had been taken into account in the forest policy outcomes. A good example of this is the Norwegian Forest Owners' Federation (NFOF) which became an important actor in forest policy. In the post-World War II era, there was a period of rebuilding and a belief of strong public planning and regulations, also regarding timber prices. NFOF was one actor in the national timber price negotiations. Therefore one can say that, even though there were no acts or regulation towards forest owners' associations, the organizations itself had grown so large that it was an important actor in the forest (and public) policy.

Italy stands aside, as a special case, where the associative movement spread more among forest workers, than among private forest owners. To become economically viable, these cooperatives of forest workers tended to associate with municipalities because of the larger size of their forest holdings.

In the group of late comers, forest owners' associations don't seem to have reached yet a "critical mass" threshold. Forest policy does not yet recognize their role in clear terms. They don't cover yet a large share of forest owners because of the several reasons which dictated their late start. With the exception of those established in a context of abundant and profitable timber resources for sale, like in Romania, the others have to rely a lot on public financial support to get started and to overcome the free rider problems at the earlier stages of their life lives.

Poland is a special case in the group of countries with economics in transition. Here land restitution was not a "triggering factor" for forest owners' associations simply because restitution of forests generally did not exist here after 1989 in contrast to the other Central and Eastern European countries. Few facts of restitution of church and other properties don't change that general view. Also, after II World War part of forests (15 % of total forest area) remained in private hands, the exception in Soviet block, if we do not count former Yugoslavia; and about 80 % of agricultural land was still in private hands. Strong position of the State Forests and much better conditions of state forests compared with most of private forests, is the main reason that there was (and is) not strong political will to change the ownership status of forests in Poland.

Still about the factors having and influence in the development of these organizations, either in the group of the first movers and in the group of the late comers, agro-tourism, carbon markets, certification and markets of wood for energy are getting more and more attention from these organizations as new and possibly expanding commercial opportunities.

Table 3. Important developments and tasks in the emergence of forest owners' organizations.

| Country | Important developments and tasks for the organizations |
|---------------------|---|
| Norway ^a | <ul style="list-style-type: none"> - Today: 8 associations with 42000 members. - In addition to these associations which organize mainly smaller forest properties, the larger forest owners (including industrial forest owners) do also have their own association – Norskog. - During the 1930s the number of members in forest owners' associations increased rapidly and the associations took over more of the timber sales in the different regions. At the same time the price negotiations grew more and more important. - During the post World War II-period timber price were, for a long time, regulated by the authorities. The forest owners' associations were therefore more and more involved in forest policy issues. The associations also build up advisory services in addition to timber sales - Engagement in industrial activities: the associations became large shareholders in pulp and paper companies and several lumber mills. - During the 1990s there have been several structural challenges in Norwegian forestry involving forest owners' associations: <ul style="list-style-type: none"> • Increased attention related to sustainable forest management. Among others, the forest owners' associations, launched and participated in the "Living Forests"-project (1995-1998), which aim was to develop standards for sustainable forestry in Norway. These standards were then used for environmental certification of forestry with the forest owners' associations as driving actors. The forest owners' associations have the expertise and capital needed to conduct (environmentally) certification of the forestry. • Accelerated structural changes in the forest industry. The industry's importance of having a mediator to the dispersed forest owner group increased. The forest owners' associations could organize the timber trade most efficient since they had an organization fit for this as well as the associations was an equal partner in mutual R&D projects. The associations do also hold ownership interests in the major forest industry firms. • The forest owners' associations have implemented various types of bonus arrangements (partly financed from finance income). - Following the restructuring in the forest industry and end-user markets as well as new claims from the market (e.g., environmental certification during the 1990s) the regional forest owners' associations merged into 8 associations and have now moved from being merely a broker for their members into being a real agent in the timber markets. - Securing members' interest in forest policy development increased focus on other outfield related activities. |
| Finland | <ul style="list-style-type: none"> - Today: 155 associations with 330,000 members. - Provide forest owners with advisory services relating to forest management and felling as well as other types of related services. Interests in timber trade and influences forest policy legislation. - Local Forest Management Associations (FMA) work in close co-operation with owners in all matters related to forests; forest management services, training and planning services, harvesting and timber sales. - The current trend is to decrease the number of FMAs to around 100. Bigger FMAs have better preconditions to provide services in forestry issues and represent and look after forest owners' interests in the situation where also forest industry and private entrepreneurs are providing same services to forest owners and competing with FMAs. |

^a Halberg (1999), NOU (1979), Størdal (2002, 2004a,b), Størdal and Lien (2005).

Table 3. Continued.

| Country | Important developments and tasks for the organization |
|----------------------|--|
| Germany ^b | <ul style="list-style-type: none"> - Today 5,403 associations with 449,000 members. - Taking over economic functions in the interest of their voluntarily organised members Instrument for: <ul style="list-style-type: none"> • influencing management standards of small forests • assembling larger, more marketable volumes of timber - Wood-selling organization. - Forestry associations not only try to engage people with a commonly shared belief in the need for timber production, but they also try to engage forest owners who manage their forests in unconventional ways. - The non-farmers are not only clearly underrepresented in the associations; they are also integrated and engaged especially little. - So-called urban forest owners gain little from the work of the associations. According to their own assessment, forest owners with large forest areas more commonly benefit from their membership in an association. |
| Ireland | <ul style="list-style-type: none"> - Approximately 1500 of the 14500 woodland owners of larger and commercially owned estates are managed by forest consultants and forest management companies. A further 4500 are well serviced by forestry co-operatives. - The main positive factor for acceptance of the forestry co-operatives is based on the great tradition built up by the agricultural co-operatives in helping small farmers over 100 years built up a good reputation as an efficient non-profit organization willing to provide whatever assistance members require improving their woodland. - The fact that in the establishment of forestry co-operatives local leadership and existing local development groups were encouraged to become involved, this insured that the local forestry programme complemented other community development. This insured an acceptance of the forestry programme at all levels and benefited it through community participation and knowledge. - Main barriers to full potential and even future existence have to do with the lack of funds. |
| Italy | <ul style="list-style-type: none"> - Private forest owners' associations are very scarce in Italy. Most of the associations working in forestry belong to the co-operative movement mostly as labor associations. However, the prevalent customers of these associations are the municipality holdings since they are larger estates to manage. The <i>Consorti Forestali</i> are mixed companies where the public forest owner and the labor cooperative work together in the following activities: <ul style="list-style-type: none"> • developing a common organisation to manage consortium resources; • defining the activities and the operations that can be implemented only in agreement with the owners; • performing technical management and action control with respect to biomass utilization and carbon sequestration; • managing partners' forest capital by keeping separate partner accounts; • developing technical advisory activities and providing access to public funding; and • focusing on integrated management of forest eco-system relating to wood, under-storey, water resources, landscape and certification (FSC, PEFSC). |
| Poland | <ul style="list-style-type: none"> - Today: 9 associations with about 400 members, and a total area up not exceeding 1000 ha. The Union of Associations of Private Forest Owners of Polish Republic was registered in 2005. - The primary functions of the associations are defined in their statutes. They are among others: education (training, courses, lectures, field trips, etc.); aid for private forest owners; supporting social initiatives concerning private forests; lobbying for environmental protection, in particular for forest protection; co-operation with other associations, national and foreign institutions, public administration and economic organizations; representing the members' interest towards administration, self-governments, as well as public and private institutions; promoting the ideas of rational forest management and protection through organising "Forest Days", dissemination and editorial activities; gaining funds in the country and abroad. |

^b Bittner (2003), Bollin and Eklkofer (2000: 52), Brabänder *et al.* (1980: 250), Brabänder (1981), Brandl (1977: 98), Bundesregierung (2004), Hårdter (2003: 65), Hilt (2003), Leinert (1996), Moog and Borchert (1999), Neumann (1984).

Table 3. Continued.

| Country | Important developments and tasks for the organization |
|---------|---|
| Hungary | <p>- Professional foresters have had a strong and continuous influence on what is now private forestry. Before changes that took place in 1989, they were the core staff of cooperatives. Nowadays their assistance to private forestry is promoted by public financial incentives awarded by the State Forest Services on a per hectare basis of the territory covered by that assistance.</p> <p>- The National Forest Programme of Hungary identified the private forest management as one of its priorities, with a specific operational programme targeting this kind of forestry. This programme includes the public incentives to foresters mentioned above, as well as incentives for the creation of forest owners' association.</p> <p>- Hungary's EU membership provides also potential for further progress.</p> <p>In terms of organisations the National Association of Private Forest Owners and Forest Managers (MEGOSZ) stabilised itself as the main organisation representing private forestry in Hungary. It has established strategic cooperation with other domestic sector players and is embedded in the European network of private forestry; consequently, good political position was achieved for further organisational development in last years.</p> <p>Internal rationalisation is in progress within the organisation, which is also a prerequisite of extension of activities and membership.</p> <p>- Further developments from this good starting position requires the following:</p> <ul style="list-style-type: none"> • preparing applications for public grants • Through increase in the financial and human resources of the Association, further specialisation on forest policy areas is needed to be successful in representing interests of the country's forest owners nationally and internationally in the EU; • Through better quality work and a more recognised, influential policy stakeholder position there is good prospective for increasing membership; • There is further potential to be better used concerning the organisation's regional representation; • Parallel to this the general societal recognition of private forestry due to better PR work is also needed; • The Association should play a central role in extension activities and capacity building in private forestry and start to work at project-level also in other areas (environment, rural development, certification, etc.); • These activities can contribute to fundraising as well; • Stronger international cooperation is needed on project and information dissemination |
| Romania | <p>- Since 1992: small associations to protect owners against timber robbery (15% of forest owners were organised in this kind of cooperation in 1997).</p> <p>- In 1997, the Association of Private Forest Owners of Romania was created to politically represent forest owners (as a federation of different forest owners); but the APPR become effective only after changes in its executive team in 2001/2002.</p> <p>- In 2000/2001: creation of associations of owners as compulsory legal entities necessary for the restitution of lands belonging to formers forest communities before nationalisation, under the Law 1/2000.</p> <p>- For the forest associations as managing structures, the legal regulations are very much unclear and sometimes confusing. The confusion is between administration and association. The difference is that the association is a private initiative of forest owners for facilitating the forest management, works and timber selling, whereas the administration is basically imposed by the State with the aim to control the legality of forest management in private forests.</p> <p>- It seems, however, that the communal forests take the leadership in organising their own structures for managing the forests (in the sense of administration). That may be a triggering factor in the local level for creating new small associations of private forest owners</p> <p>From 2005 onwards: creation of associations for the management of forests, part of them with support from the SAPARD Programme.</p> <p>- A good stock of timber for sale at profitable prices allows the associations to start up and develop without need of public financial support</p> <p>- Certification, markets of wood for energy, agro-tourism and carbon markets are getting attention by a growing number of associations as possible new commercial opportunities</p> |

Table 3. Continued.

| Country | Important developments and tasks for the organization |
|-----------------------|---|
| Portugal ^c | <p>- In 2006 there are 173 associations recorded by the State Forest Services (more than twice the number existing in 1998). The associations are split into:</p> <ul style="list-style-type: none"> • a group affiliated with <i>FORESTIS-Associação Florestal de Portugal</i>, based mostly in the northern and central regions where small scale forestry is largely predominant; • a group affiliated with <i>FPPF-Federação dos Produtores Florestais de Portugal</i>, based mostly in the southern regions where large scale forestry is predominant; • a group affiliated with <i>FENAFLORESTA</i>, the forestry federation of the national confederation of agricultural cooperatives; • a group without affiliation. <p>- Most of the organisations were created independently of the existing farmers' cooperative movement. Reasons for this include:</p> <ul style="list-style-type: none"> • many owners in the Northern and Central regions were promoted by FORESTIS; and • In the southern regions where large scale forestry is predominant, they were promoted and are currently affiliated with FPPF. <p>The existing forest owners' organisations have two main types of primary functions:</p> <ul style="list-style-type: none"> • the provision of services which are public goods or are related to externalities in forest management: representation and defence of the collective interests of their members; raising society's awareness for the importance of forest public goods; spreading information among their members and also among the rest of the population about what should be done to protect and promote forest resources; reducing the risk of forest fires; • the provision of private services to their members: technical advice, including the forest management plans necessary to apply for public financial incentives. <p>- Some initial steps are taken towards certification, but the process is still at a very early stage.</p> <p>- The organizations are absent with regard to economic accounting and legal advice, as well as harvesting and marketing of forest products and engagement in forest industries</p> <p>- While the emergence of forest owners' organisations is probably the major structural change in Portuguese forestry, they are still far from having made a strong impact in the sector and in the society at large. The reasons are the following:</p> <ul style="list-style-type: none"> • in the regions of small scale forestry where they are more relevant, after having attracted a great deal of the forest owners with medium sized holdings, they face the very difficult task of attracting the large number of very small forest owners which are responsible for most of the rest of the forest land; • because they are split among three different national affiliations which are not likely to unify in a single representation, the existing forest owners' organisations lack a united and strong political influence, in line with the number of organisations and members this movement already has; • even though there are more and more recognition in the Public Administration of the positive role played by forest owners' organisations, the legacy of more than one century of forest policies based on public direct intervention and neglect of the need for collective organisation of private forestry is still very much present (Mendes 2005c); • at the local level, most of the municipalities don't recognize and don't do their best to support the collective organisation of private forestry, preferring to intervene in this area more with electoral motives, than with the serious purpose of contributing for that kind of organisation; • the business men, including the ones in the forest industries, often have a hard time to understand the capabilities and the needs of non profit organisations; • very much of the future prospects of forest owners' organisations will depend on how these difficulties will or will not be overcome, the availability of public financial support remaining crucial for the viability of all of them, as long as their main outputs have a public goods nature; and • Forest Fund created in 2003 whose main mission should have been to pay the private forest owners for the environmental services provided by their forests which could have been a good source of financial support for forest owners' associations is being diverted to funding personnel and expenditures of municipalities, not necessarily with string ties to private forestry. <p>- Certification, markets of wood for energy, agro-tourism and carbon markets are getting attention by a growing number of associations as possible new commercial opportunities.</p> |

^c Mendes (1998, 2001, 2005a, 2005b); DGRF (2006)

4. CONCLUSIONS: SUPPORTING AND IMPEDING FACTORS TO COLLECTIVE ENTREPRENEURSHIP

In this paper we looked at a particular form of entrepreneurship in forestry, namely the collective organization of forest owners in associations able to represent their common interests and provide them some services they need. In spite of the broad range of country cases covered here, a common kind of factor to the take off of this kind of organization is the existence of a triggering factor calling of the collective action of forest owners. In fact, in all the cases covered here forest owners' associations only got started after a major change in the economic and/or political environment where forest owners' lived in.

This triggering factor normally led forest owners to organize in associations whose missions included to reaping of some efficiency gains or the purposive defence of some common interests. So, "constructivist rationality" seems to have been present as a motivation for the start up of this kind of entrepreneurship.

However, "ecological rationality" seems to have played a complimentary role in this take off. In fact, in the group of countries covered in this paper there is a clear dividing line between "first movers" and "late comers" in terms of forest owners' associations take off. To explain this difference, "constructivist rationality", or efficiency motives are not enough. Cultural and political factors should also be taken into account. In fact, forest owners' associations take off seem to have benefited from a cultural environment favourable to free cooperation among private agents and from a political environment where democracy prevails.

Looking now at the supporting factors of forest owners' association development, the country cases presented here point out to another dividing line separating the same two groups of countries. This dividing line now has to do with the point where their forest owners' associations are in terms of reaching a threshold of self-sustainability, without high reliance on public financial support. Reaching this kind of critical mass seems to be related to the capacity of these organizations to get effectively involved in commercial activities (marketing of forest products marketing, participation in forest industries, agro-tourism, etc.) and in the forest policy process. So, both the proceeds coming from commercial activities and the favourable policy outcomes obtained from participation in the forest policy process seem to have been supporting factors of the development of these organizations.

In the group of late comers, forest owners' associations are still distant from those levels of involvement in marketing and policy formation. Therefore current and future developments of these organizations may be hindered by these factors.

By looking at these differences and also at some broad similarities, the main conclusion drawn from these case studies is that an appropriate theoretical framework to analyze the supporting and impeding factors of forest owners' associations start up and development is one that should combine two kinds of rationalities: "constructivist rationality" which takes into account the role of efficiency factors, and "ecological rationality" which takes into account the role of social norms and political factors.

As a general conclusion from these case studies, on the theoretical front, it seems that an adequate framework to analyze the supporting and impeding factors of forest owners' associations start up and development is one that should combine two kinds of rationalities, instead of putting one against the other: "constructivist rationality" which takes into account the role of efficiency factors, and "ecological rationality" which takes into account the role of social norms and political factors.

REFERENCES

- Bittner, A., 2003. Im Spannungsfeld zwischen Umweltkommunikation und Hilfe zur Selbsthilfe: Die Beratung nichtbäuerlicher Kleinwaldbesitzer. In: Schraml, U. and Volz, K.-R., (eds.). *Urbane Waldbesitzer. Studien zur Beratung und Betreuung im nichtbäuerlichen Kleinprivatwald. Freiburger Schriften zur Forst- und Umweltpolitik* 1:117-159. In German.
- Bollin, N. and Ekikofer, E., 2000. Mobilisierungsstudie Holz. Ergebnisse einer Umfrage im Kleinprivatwald in Niederbayern im Auftrag von MD-Papier. Freising. In German.
- Brabänder, H.D., Koester, U. and Hodapp, W., 1980. Nutzen-Kosten-Untersuchung der forstwirtschaftlichen Zusammenschlüsse. *Schriften aus der Forstlichen Fakultät der Universität Göttingen und der Niedersächsischen Forstlichen Versuchsanstalt* 65. Frankfurt am Main, Sauerländer. In German.
- Brabänder, H.D., 1981. Subsidies and efficiency in forestry co-operatives. *Silva Fennica* 15(1):79-84.
- Brandl, H., 1977. Organisatorische Gestaltungsprobleme in forstwirtschaftlichen Zusammenschlüssen. *Mitteilungen der Forstlichen Versuchs- und Forschungsanstalt Baden-Württemberg*, Vol. 81, Freiburg. In German.
- Bundesregierung. 2004. Ernährungs- und agrarpolitischer Bericht der Bundesregierung 2004. <http://www4.verbraucherministerium.de/>. 15.11.2004.
- CO.LA.FOR. <http://www.colafor.it/ARCHIVIO/colafor.html>.
- DGF – Direcção Geral das Florestas. 2001. Inventário Florestal Nacional. Portugal Continental. 3.^a Revisão, 1995-1998. Lisbon: Direcção-Geral das Florestas.
- Halberg, P.T., 1999. Bjelker i Bygde-Norge. Skogeierorganisasjonen og skogbruksnæringen 1984-1994 med fokus på Glomma-vassdraget. Glommen skogeierforening. In Norwegian.

- Hilt, J., 2003. Das Paradoxon der Förderung forstwirtschaftlicher Zusammenschlüsse in Baden-Württemberg, Diplomarbeit am Institut für Forstpolitik, Freiburg. In German.
- DGRF - Direcção Geral dos Recursos Florestais. 2006. Estratégia Nacional para as Florestas. Versão Preliminar para Discussão Pública. 21 de Março de 2006. Lisbon: Direcção Geral dos Recursos Florestais.
- Härdter, U., 2003. Nichtbäuerliche Waldbesitzer. Strukturierung und Charakterisierung im Kontext gesellschaftlicher Entwicklungstrends. In: Schraml, U. and Volz, K.-R., (Eds.). Urbane Waldbesitzer. Studien zur Beratung und Betreuung im nichtbäuerlichen Kleinprivatwald. Freiburger Schriften zur Forst- und Umweltpolitik 1:25-83. In German.
- INE-Instituto Nacional de Estatística. 1997. A floresta nas explorações agrícolas 1995. Lisbon: Instituto Nacional de Estatística.
- Leinert, S., 1996. Weiterentwicklung von forstwirtschaftlichen Zusammenschlüssen zu Dienstleistungszentren. Studie im Auftrag der Arbeitsgemeinschaft Deutscher Waldbesitzerverbände (AGDW), Dreieich. In German.
- Mendes, A.M.S.C., 1998. Forest owners' associations as a case of joint production of public goods and private services: A game-theoretical approach. In: Atsushi Yoshimoto and Kiyoshi Yukutake (Eds.). Proceedings of the International Symposium on Global Concerns for Forest Resource Utilization - Sustainable Use and Management, October 5-8, 1998. Department of Agricultural & Forest Economics, Myazaki University. Vol I. pp. 186-196.
- Mendes, A.M.S.C., 2001. Forest owners' collective action against the risk of forest fire: A game theoretical approach. In: The Economics of Natural Hazards in Forestry, 7-10, June, 2001, CTFC-EFI, Solsona, Catalonia, Spain. IUFRO Division 4. 4.04.02 - Managerial Economics in Forestry and 4.13.00 - Managerial, Social and Environmental Accounting. Padua: Padua University Press. 2001. Pp. 137-141.
- Mendes, A.M.S.C., 2005a. Implementation Analysis of Forest Programmes: Some theoretical notes and an example. Paper accepted for publication in Forest Policy and Economics.
- Mendes, A.M.S.C., 2005b. The role of institutions in forest development: the case of Forest Services and forest owners' associations in Portugal. Paper presented at the International Conference "The Multifunctional Role of Forests – Policies, Methods and Case-Studies", University of Padova, 29 April, 2005.
- Mendes, A.M.S.C., Feliciano, D., Tavares, M. and Dias R., 2004. Portuguese Forests. Country level report delivered to Project EFFE – Evaluating Financing of Forestry in Europe. Porto: Faculty of Economics and Management – Portuguese Catholic University.
- Moog, M. and Borchert, H., 1999. Kosten und Nutzen forstwirtschaftlicher Zusammenschlüsse. In: Die Bedeutung forstwirtschaftlicher Zusammenschlüsse als Marktpartner: Herausforderungen und Entwicklungsmöglichkeiten, Forstwissenschaftliche Fakultät der Universität München, München, Frank. Pp 1-20. In German.
- Neumann, W., 1984. Zur Stellung des Mitglieds in agrarischen Kooperativen. Dissertation Universität Freiburg. In German.

- NOU 1979. Tømmerprisene. Fra utvalg til utredning av spørsmål i forbindelse med fastsetting av tømmerprisene oppnevnt ved kgl res av 21. juli 1977. Norges offentlige utredninger, NOU 1979:13. In Norwegian.
- Marwell, G. and Oliver, P.E., 1993. The critical mass in collective action: A micro social theory. New York: Cambridge University Press.
- North, Douglass C., 1990. Institutions, Institutional Change and Economic Performance. Cambridge: Cambridge University Press.
- Olson, M., 1971. The Logic of Collective Action. Public Goods and the Theory of Groups. Cambridge, MA: Harvard University Press.
- Pettenella, D., Klöhn, S., Brun, F., Carbone, F., Venzi, L., Cesaro, L. and Ciccamesse, L. 2005. Italy. In: Jáger, L. (ed.), 2005. COST E30 Economic integration of urban consumers' demand and rural forestry production. Forest sector entrepreneurship in Europe: Country studies. Acta Silvatica & Lignaria Hungarica. Special Edition 2005: 383-435.
- Rapp, P., 1998. Forstbetriebsgemeinschaften in Baden-Württemberg. Eine Untersuchung zur Struktur und Aufgabenerfüllung von Forstbetriebsgemeinschaften in Baden-Württemberg. Institut für Forstpolitik, Untersuchungsbericht III/1998, Freiburg. In German.
- Smith, V.L., 2003. Constructivist and Ecological Rationality in Economics. The American Economic Review 93(3):465-508.
- Statistics Norway 2004. Forestry Statistics. <http://www.ssb.no/english/subjects/10/04/20/>
- Størdal, S., 2002. The Economics of Timber Sales – Studies of the Norwegian Roundwood Market. Doctor scientiarum theses 2002:50, Agricultural University of Norway.
- Størdal, S., 2004a. Impacts of the European Economic Area agreement on the structure and concentration of roundwood sales in Norway. Forest Policy and Economics 6:49-62.
- Størdal, S., 2004b. Efficient timber pricing and purchasing behaviour in forest owners' associations. Journal of Forest Economics 10:135-147.
- Størdal, S., and Lien G., 2005. Kunde- og leverandørtilpasset omsetning av tømmer – En diskusjon om virkemidler og bonusordninger i norsk tømmeromsetning med resultater fra en undersøkelse blant medlemmer i Mjøsen skogeierforening. ØF-rapport nr 10/2005, Lillehammer. In Norwegian.
- Waddock, S. A., 1991. A Typology of Social Partnership Organizations. Administration and Society 22(4):480-515.

THE IMPACTS OF GOVERNMENT LEGISLATION AND POLICY OR PROJECTS ON PRIVATE FORESTRY

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SUMMARY

The research focus of this article is to analyse the intent and impacts (positive and negative) of government legislation and policy or projects on private forestry and innovation and entrepreneurship. Some countries have specific legislation and policy or projects to promote greater innovation and entrepreneurship in private forestry. At other times the impacts result from other forestry policy – or even policy not directly related to forestry. Government legislation and policy can have a wide range of impacts on private forestry in Europe, with the scale and scope of the impacts being determined by amongst other things:

- The types of legislation and policy.
- The ability of the government to impose and monitor/enforce it.
- The level of sophistication and capacity of the forestry owners.
- The nature of the private property law and property rights of the private forest owner.

The legislation and policy arena is becoming increasingly more complex, particularly for sectors such as forestry which deals with extremely long time periods of time for investment and returns. The long time periods make it particularly difficult to anticipate and address the constant social, economic and environmental change - and the efforts of legislation, policy and specific government projects to intervene in society as a whole and specifically in the forestry sector. Growing understanding of each one of the three aspects of sustainability (society, environment and economy) further complicates things, not only within each of the three but as importantly in how they interact and influence each other.

An additional level of complexity results from increasing globalisation, and the freer flow of finance and goods and services. When you consider the profound

implications of synchronising trade through GATT and other mechanisms, and efforts to even coordinate government – through the establishment of organisations such as the European Union – the implications are truly profound.

While private forestry plays significant roles in many countries, it typically faces greater challenges - than the larger and often more coordinated industrial forest sector - in organising a coherent response to ongoing challenges. Private forestry typically does not have the same high degree of political or economic influence over government in the creation of legislation, policy and specific projects.

1. RESEARCH AREAS AND CASE STUDIES

The criteria to select the legislation and policy or projects to be analysed are largely driven by their potential impacts on the economics, innovation and entrepreneurship of private forestry. These impacts can be either positive or negative – and at times can be bits of both. Policies may not economically influence the activities in private forestry, but can still contribute to a shift in the mode of production or organisation or degree of innovation. Examples of legislation or policies/projects with potential impacts on private forestry include, but are not limited to:

- Policies for the association/administration of private owners.
- Policies for stimulating the sound use of timber from private forestry.
- Policies in support of rapid growing species (ex. Poplar) and for afforestation of marginal lands.
- Policies (if any) to stimulate the provision of forest services, etc.

We will not be considering the use of compensatory financial instruments for nature protection reasons, however, nature protection measures and projects could be considered if they provide incentives for shifting from a focus on timber production to supplying other forest services (such as environmental services, recreation, non-timber products, landscape values, water and soil management) that reflect an innovative new way to address forestry management and which are more compatible with the nature protection goals.

The case studies address the following four main subject areas:

- What is the government legislation or policy or projects that are impacting private forestry?
- What is the nature of the impacts?
- Are the impacts intentional or unintentional from the policy, legislation or project?

- What could be done to increase positive impacts or decrease negative impacts?

2. OVERVIEW OF THE IMPACTS OF GOVERNMENT LEGISLATION AND POLICY OR PROJECTS ON PRIVATE FORESTRY

The critical role that forests play in providing social, environmental and economic benefits throughout Europe is recognised and supported by national forest legislation and national forest programmes (Bauer et al. 2004). Forest legislation development in Europe is both dynamic and innovative, with new or amended laws being developed over recent years in practically every nation. This rapid change has been most pronounced in Eastern and Central Europe with changes in political systems and land tenure. Western European forest legislation change has been largely driven by the growing understanding and support for the multiple uses and societal requirements of forests and good forestry management. This coupled with the implementation of international agreements concerning forestry has led to a more pronounced interest in integrated forest ecosystem and landscape management (ibid).

Reforestation after harvesting, forest fire, disease or storm damage has been a traditional goal of European societies and an important issue in the relationship between society at large and forest owners specifically. There is increasing global concern about deforestation, but in general, forests in Europe are increasing in both area, and volume, In many countries there is also a focus on the environmental function of forests leading to alternative forestry strategies and a greater emphasis on societal and ecosystem functions. Certification certainly plays an important role in this regard (Mitchell-Banks 2006).

The resources and research scope of this sub-group is not large enough to address all forest legislation, policy and projects impacting on private forestry in Europe. This paper will briefly address general findings on reforestation, public access and the public use of non-wood forest products (NWFPs) and will then provide five short country cases demonstrating the different impacts of forest legislation and policy or projects on private forestry.

2.1. Reforestation

The applicable laws for reforestation vary across Europe, with notable differences with regard to forest legislation including:

- Differences in how detailed the regulations of the forest law are. In several cases the provision of the law is quite general and does not set specific commitments for obligatory reforestation after final cuttings.
- Emphasis is usually placed on obligatory replanting after clear-cuttings whereas provisions concerning natural regeneration are either missing or are vaguely formulated.
- In many countries the law does not set time limits for replanting or natural regeneration nor does it define criteria of what is to be considered a successfully regenerated forest stand.
- Reforestation is obligatory and some kind of time limit for regeneration is defined in the forest laws of Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Finland, Hungary, Lithuania, Poland, Romania and Sweden.
- The law of Estonia requires in a general way owners to ensure the conditions for regeneration and reforestation. It requires replanting clear cut areas and degraded stands, and defines under which conditions natural regeneration may be practiced.
- The laws of France, Germany, Slovak Republic and Switzerland require reforestation in a general manner as part of the principle of sustainable forest management and planning. In the case of Switzerland and Germany the state forest laws of the Cantons and Länder contain complementary provisions and must be consulted.
- According to the law of Slovenia, reforestation is obligatory but there are no detailed regulations concerning natural regeneration.
- The law of the Russian Federation obliges forest users to carry out reforestation work but obligations of lease and concession agreements concerning forest reproduction are made on a case by case basis. No time limits for satisfying regeneration periods are defined in the law.
- In Norway the law does not include strict rules for regeneration, but provides that felling must be done in such a manner that promotes future production or re-vegetation.
- In the United Kingdom felling licences issued on land managed by the Forestry Commission usually include conditions for restocking.
- In the forest law of Turkey protection and extension of forests is considered important, but little is said about replanting or natural regeneration.

- In Cyprus, no specific regulations exist but the silvicultural system practiced in the state forests encourages natural regeneration and planting is used when natural regeneration fails (Bauer et al. 2004, pp. 13-14).

A common European approach to rules concerning legal commitments regulating regeneration of forest stand after cutting, or loss of forest cover resulting from other interventions and natural calamities could be formulated as follows.

- A cleared area on forest land shall be reforested in a reasonable time frame as specified by regulations and/or national forest management authorities.
- The forest owner shall regenerate forest stands after clear-cutting or if destroyed by forest fires, diseases or storms.
- Replacement of forest stands can either be performed by natural regeneration or by planting and seeding.
- Species used must be site appropriate and the quality of the planting stock is to be specified on an ecological basis by implementing rules, guidelines or regulations.
- Changes of forest land into other forms of land use (agriculture/urbanisation/industrialisation) require separate and specific regulations procedures by the national forest law (Bauer et al. 2004, p.14).

2.2. Public access

Public access is a fundamental right found in many European countries, though the principle of free access can be subject to certain restrictions to ensure that the forest owner is protected and that recreation and other amenities are addressed. For some European countries public access is limited to only State forests, with access to private forests only obtained through permission from the owner. The issue of public access to forests often has a long historical basis, with this being acknowledged in legislation and with any restrictions being detailed through specific laws. In the Nordic countries, access is not as restricted and is referred to in legislation.

Notable differences between the legislation across European countries include:

- Whether public access rights to forests are regulated by the forest law or by other legislation.
- The extent of formally acknowledged access rights in forests and the precision with which they are regulated.
- The differences in regulating access rights between private and public forests.

- The differences in determining the allowable uses of forest visitors.
- The extent of the rights and obligations of landowner and forest authorities to regulate, restrict or prohibit public access rights in specific areas or forest stands and the justifications of such regulations and prohibitions.
- The possibilities of forest owners and public authorities to regulate, restrict or prohibit certain conditions of access, the use of motor vehicles, and certain use practices of forest visitors.
- The incentives to private forest owners for allowing access and use practices of visitors in their forests.
- Reimbursement of additional costs for appropriate installations that result from public access in forests, and reimbursement and compensation for damages that may be caused by visitors (Bauer et al. 2004, pp. 19-20).

Most European countries guarantee free access to forests and usually include some restrictions or prohibitions – the minimum restriction being that no damage, harm or inconvenience is caused by the visitors. There are big differences in terms of which forests can be accessed. In the United Kingdom, Poland, France and Turkey, for example, access is only allowed in public forests whereas access in private forests and wood-lots requires an authorization from the owner. In several countries like Austria, Czech Republic, Estonia, Hungary or Slovenia owners are entitled to restrict access to the forest for specific reasons. In Switzerland the federal forest law obliges the Canton to ensure that the public has access to the forest but empowers the Cantons to restrict access to certain areas if it is necessary for forest conservation or some other public interest. Some forest laws do not explicitly refer to public access although they may regulate the use of forest roads such as in the case of Bulgaria, Croatia, Cyprus, Finland and Romania (Bauer et al. 2004, p. 20).

The means of access (foot, cycling, riding or using motor vehicles) is regulated various ways. The most important and widespread regulation refers to the use of motor vehicles, which is generally prohibited for the public or severely restricted. Exceptions to this rule may be made by the competent public authorities and/or by the land owners for specific reasons as determined in the law. Driving of motor vehicles off road and also on certain forest roads is for example prohibited in countries like the Czech Republic, Hungary, Liechtenstein, Switzerland and Sweden. Cycling and riding may be restricted to specific paths and roads such as in Austria, Germany and Norway. Access to certain categories of forest lands may be prohibited with motor

vehicles e.g. Bosnia and Herzegovina and the Slovak Republic. Public access to certain forests may not be possible for any vehicle e.g. in the United Kingdom (Bauer et al. 2004. p. 20).

A common European approach to public access to forests could be considered in the following manner:

- The public has the general right to access forests provided that no damage or harm results from such uses to forest stands and environment.
- Appropriate precautions must be taken by the visitors to avoid inconveniences to forest owners and damage to their property resulting from the admitted access and use practices.
- Necessary instructions of the owner or tenant of the forest are to be respected.
- Restrictions of access and use rights may be determined by the competent public authorities and/or the forest owner for reasons of forest protection or in the interest of health and safety of the public.
- Allowable restrictions and prohibitions must be specified by law and regulations (Bauer et al. 2004, p. 20).

2.3. Public use of non-wood forest products

The public use of Non-Wood Forest Products (NWFP) such as mushrooms, leaves, berries, litter, brushwood, fodder, etc., was for many historically essential to survive. For most European countries, this is no longer the case, and the practices, particularly of berry and mushroom gathering, have become largely a form of recreation and supply important amenity values. In the poorer European countries, however, NWFP continue to play a critical role in the livelihood of people not only for their personal needs but also for income generation.

In many countries the public has the right to use at least some non-wood forest products. Notable differences in forest law regulations are:

- The differences in the availability determined by the economic and social relevance, of NWFP.
- The distinction between public and private forests in as much as the use regimes may show considerable differences.
- The type of products that may be collected.

- Restrictions that may be made regarding the quantity and methods that are admitted for collection.
- Differences in regulation with regard to collection of NWFP for individual and family uses versus collection for commercial uses and trade.
- Private and public forest owner rights to require special authorizations or to issue licenses for the collection of all or for certain NWFP (Bauer et al. 2004, p. 25).

There is a considerable variation between the countries in terms of rights, restrictions and obligations to collect and use non-wood forest products. Five country groups can be distinguished:

1. There are countries where the rights to use NWFP are very broad and refer to different categories of ownership of the forest, for instance, in Austria, Bulgaria, Czech Republic, Hungary, Nordic countries, Slovak Republic and Russia.
2. There are countries where the public has general rights to use NWFP, but where land owners may restrict or prohibit the use of certain products or may charge fees for their collection such as in Bosnia and Herzegovina, Estonia, and Slovenia.
3. There are also cases such as Poland where the collectors have considerable rights in public forests but where collection in private forests may be prohibited without permission of the landowner.
4. Another group is formed by countries where use of non-wood forest products requires generally permission with or without payment from the collector, and where collection can be totally prohibited, for example, in private forests such as in Croatia, Cyprus, France, Lithuania, Turkey and the UK.
5. There are also countries where the national forestry law does not explicitly refer to the use of NWFP. Relevant regulations may exist in other national legislation such as nature protection acts, land ownership legislation or civil codes. In countries with a federal and state legislation such as Germany and Switzerland the complementary sub-national forest legislation must be consulted (Bauer et al. 2004. p. 25).

A common European approach to public use of NWFP could be as follow:

- The public has the general right to gather non-wood forest products such as berries, mushrooms, nuts, leaves and brushwood.

- Collection of NWFP should not endanger the survival and productivity of the forests in which they are collected.
- The products to be collected have to be determined by law or by the private and public forest owners.
- A distinction in regulation between collection for individual and family consumption versus commercial collection may be required.
- Different legal regimes for collection of NWFP in public and private forests may be necessary.
- Restrictions of this right as well as expansions towards the use of non-wood forest products for commercial purposes require special legislative regulations (Bauer et al. 2004. p. 25).

It is obvious that while there are differences in the various countries' legislation and law, there is a tremendous amount of similarity with the basic regulations. That being said, different legislation, policy or projects (both directly and indirectly related to forestry) can have very different impacts on private forestry based on not only the national setting but also the regional location within that country. The following five case studies provide empirical evidence of the various impacts.

3. CASE STUDIES

3.1. The Living Forests Process and its legacy on private forestry in Norway

Introduction

Norway is a country of small-scale forestry, with most of the forest ownership with small farm-foresters. The forest owners are organised through a series of forest owners associations, who play a key role in working with the government on forestry and related rural development policy and legislation. Norwegian forestry has traditionally played an important role in the economy and cultural context of the country. The law of virtual free access (everyman's right) to private land for recreation and activities such as walking, skiing, berry or mushroom gathering for private use, has supported the frequent use of the forests by many Norwegians. Forestry remains an important issue in terms of its environmental, economic and social impacts. Some of the factors that have influenced the evolution of small-scale forestry in Norway (Mitchell-Banks 2005) include, but are not limited to:

- Global forestry markets in which new cheaper suppliers of forestry products have entered the market and have captured previous markets from Norwegian

forestry companies – examples are countries such as from the Baltic States, Poland, etc.

- Traditional forestry countries such as Finland and Sweden who have increased their forestry output and become more competitive.
- Rural-urban migration and increasing absentee forest owners in Norway.
- The change over the last four decades in the Norwegian economy driven by the discovery of vast exploitable oil and gas reserves off the coast and the economic implications of this dominant economic sector.
- The impediment to forestry property sale and transfer through Allodial Law that significantly impedes the creation of larger small-scale forests.

What is the government legislation or policy/projects that are impacting private forestry?

Forestry planning and management in Norway is done at the local and regional levels but coordinated at a more national level through the forest owners associations, the forest industry and of course the Norwegian government itself through their laws and policies. This is a process that involves public participation at all levels (Barstad and Mitchell-Banks 2005, Øistad, no date).

The *Living Forests Project* is one of the elements of the 'shadow' Norwegian national forest programme (NFP) – Norway has no formal national forest programme with an aggregate of forest policies and initiatives serving as a surrogate NFP. Both the Living Forest Project and the government's involvement in forestry management includes a number of government ministries, agencies and policies, and these are all subjected to forces from the social, environmental and economic areas, and as such the approach to forestry management evolves over time (Barstad and Mitchell-Banks 2005). The Living Forests Project was a broadly based public participation initiative addressing sustainable forest management in Norway and was driven by the perceived need to address growing international market concern over the environment, a need for more sustainable forestry and a desire for the Norwegian Forestry sector to be seen as carrying out forestry that was more sustainable in the longer term.

The Living Forests Project was established in 1995 and ran for three years. The project originated from a 1994 initiative of the Norwegian forest owners and Norwegian forest industries that financed the detailed planning of the project. The Living Forests Project followed a strategy of first defining how to manage Norwegian forests in a sustainable fashion and then addressing the documentation issues (Living Forests

Project website, no date). The development of the living forests standards was based on a number of elements including: research projects, test area results from various parts of Norway, and specific research studies. The intent of these linked elements was to establish an approved set of recommendations based on science and facts on how to manage Norwegian forests in a more sustainable manner. There was an explicit intent to distribute the information to a wide range of stakeholder organisations and others, with the two primary target audiences being the Norwegian forest owners and the Norwegian forest industry.

The main objectives of the Living Forests Project were: 1) to help create Norwegian and international confidence in the raw materials from the Norwegian forest industry being based on sustainable and environmentally friendly Norwegian forest management, and 2) to indicate the will and ability of Norwegian forestry in long-term resource management through R&D, competence building and information, making the raw material an asset and thereby develop and secure employment and added value in Norwegian forests and forest industries (Living Forests Project website, no date).

The Living Forests Project had four distinct sub-projects, each having their individual boards, agendas and timelines. The four sub-projects were:

1. The international market
2. Criteria and documentation for sustainable forestry management
3. Competence Building
4. Building up an information base.

Are the impacts intentional or unintentional from the policy, legislation or project?

The impacts from this policy process project that has been incorporated into the 'shadow' national forest programme are intentional. There was an explicit desire to address market concerns about sustainable forestry and to undertake a process to improve Norwegian forestry practices (for both industrial and private forestry) and for Norway to be seen by the international market to be committed to sustainable forestry.

What is the nature of the impacts?

The Living Forests Project was substantive in that it achieved the following:

- Involving the Norwegian forest owners, Norwegian forest industry, Norwegian government and a number of NGOs in an extended cooperative project

attempted to address achieving more sustainable forest management in Norway.

- The Living Forests Project represented a paradigm shift in that it brought together a wide range of interests to address the potentially contentious issue of how to conduct more sustainable forestry and support the Norwegian forest sector.
- The Living Forest Project is acknowledged (their direct funding of and referral to the initiative) by the Norwegian government to be a key informative component in forest management and planning and a supporting element of government forestry policy.
- Even though the Living Forest Project has officially ended, certain initiatives that originated in that project continue on today, some continuing to be examined and revised.

The four working groups all had specific mandates to address and produced concrete deliverables that had a broad impact on both industrial and private forestry in Norway.

Working group 1 addressed the market and the competing materials, such as plastics, steel, aluminium, concrete, and gypsum industries and their market role and impacts on forest products. An international forum of co-operation was established, involving other countries and FAO/ECE experts, and a series of reports were produced that addressed the construction building markets and how forest products were faring and strategies to promote forest products more environmentally and secure increased sales.

Working group 2 addressed the criteria and documentation systems for sustainable forest management. This was the most challenging of the working group tasks, and received the greatest financing in the Living Forest Project. A series of reports were produced investigating sustainable forest management challenges. The most important outcome was reached on March 27, 1998 when a consensus was reached among all 13 stakeholders of working group 2 on 23 performance level standards for sustainable forestry management in Norway resulting in the living forests standards (ibid).

Working group 3 focussed on competence building. Running parallel to the work preparing the comprehensive standard documents that had been the basis for the negotiations on what performance levels were to be chosen, the project supported ongoing initiatives to share knowledge about bio-diversity in the forests with forest

owners and forest workers. Living forests took the initiative and financed courses to update more than 500 forest officers about bio-diversity and multiple-use in the forests. The courses were run by the Forest extension service institute. The Living Forests Project also developed and ran courses for sales and marketing people within the forest industries.

Working group 4 addressed information. It created a communication strategy and information material as well as co-ordinated participation at exhibitions and conferences in close co-operation with the project secretariat. In addition to newsletters and reports, The Living Forest Project published a number of fact sheets in Norwegian, English and German. The project also produced several overhead series, published brochures, participated at exhibitions, provided an information service during customer visits to Norway and informed journalists and others about the work carried out under the initiative. The Living Forests Project has its own home page with newsletters and fact sheets in Norwegian, English and German <http://www.levendeskog.no>.

When possible, information activities abroad were carried out within a Nordic co-operation approach. An example of this was the Living Forest Project supporting the development of new study material appropriate for primary schools in Great Britain, as a part of the British "Forest education initiative". The project also involved Nordic TV projects in the Netherlands and Germany. In addition, the project was represented with speakers at a number of conferences, in Norway as well as abroad in Sweden, Finland, Denmark, Switzerland, Austria, the Netherlands, Portugal and Canada.

What could be done to increase positive impacts or decrease negative impacts?

A review of the Living Forest Project (Arnesen et al. 2004) indicated the following weaknesses with the process:

- Some of the NGOs (none of the major NGOs) withdrew from the process while underway or in the period after the end of the official project (but with initiatives still ongoing and developing) due to divergent views or frustration over the process.
- Concerns about the apparent lack of coordination between the government ministries involved.
- There were delays in information reaching all of the stakeholders. Forestry interests (owners, industry, government) received information in a more timely fashion than the NGOs and other participants.

While the initiative is officially over, there is still work being carried on, in particular with respect to: the living forest standards and forest certification, information dissemination, and training related to sustainable forest management. The Living Forest Project resembled a meeting place, where not only the project results, but the process itself has been a part of the challenge and target. The project brought together a broad spectrum of government, industry and non-governmental organisations with interests in the forest sector and came out with a number of concrete deliverable and action items – some of which continue to this day. There is no doubt that the impacts of the living forest process essentially still ‘live’ and have had a significant impact on the non-formal or ‘shadow’ Norwegian national forest programme (Barstad and Mitchell-Banks 2005) as well as in the day-to-day operations of forestry and its impacts, both positive and negative, on the surrounding environment, society and economy. The main challenge ahead is implementing the living forests standards in practical forest operations, to ensure that sustainable forest management is conducted in Norway (Mitchell-Banks 2006).

3. 2. Public financing to support non-industrial private forestry in Finland

What is the Government legislation or policy/projects that are impacting private forestry?

Public financing of non-industrial private forestry (NIPF) in Finland aims to increase wood production and support sustainable forest management.

What is the nature of the impacts?

The amount of national and EU financing to NIPF in 1999 was roughly 130 million euros (Figure 1). For comparison, tax concessions to NIPF in 1999 were equal to 90 million euros (Figure 2) and the tax revenue from NIPF 467 million euros (Figure 3) (Leppänen et al. 2005).

As indicated in Figures 1–3, the net support of NIPF to the state budget was approximately 247 million euro in 1999. This was due to the use of timber from NIPF forests for wood processing, which accounts for approximately 45 million cubic meters annually. This is more than 60 % of all timber used in forest industries in Finland.

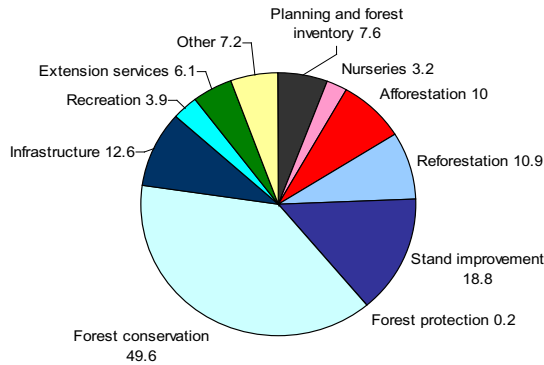


Figure 1. Public financing (national and EU) for different measures for forestry in 1999 (Leppänen et al. 2005).

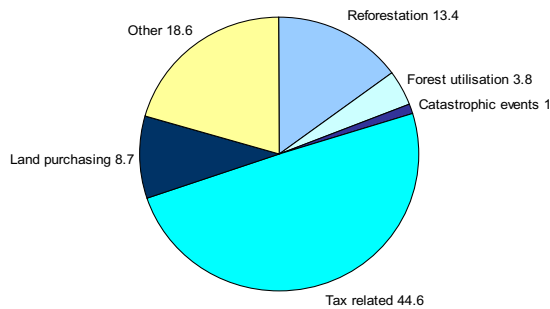


Figure 2. NIPF tax concessions for different measures of forestry in 1999 (Leppänen et al. 2005).

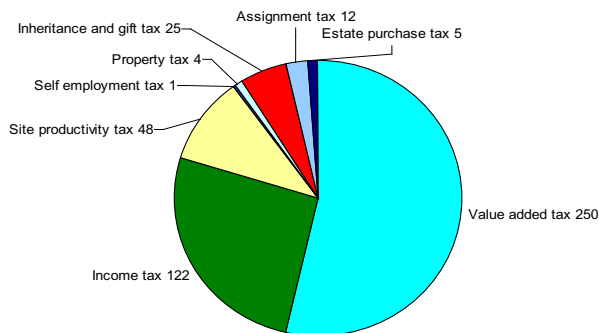


Figure 3. NIPF tax revenues for the state in 2000 (Leppänen et al. 2005).

Are the impacts intentional or unintentional from the policy, legislation or project?

Because forest growth is slow and rotation ages are long in Finland, the benefits of public financing to support NIPF are not available for 60-100 years from initial funding. Comparisons between current costs of public financing and future benefits in forest growth are not therefore reasonable.

However, if we look at the previous public financing and support to NIPF and current timber use, it can be estimated that earlier public support to NIPF has been very profitable. For example, the annual increase in forest growth, when compared to the year 1960 when the extensive public financing started, has been approximately 15 million cubic meters (Leppänen and Vatanen 2004). Since not all of this additional growth is used commercially, the impact of public financing on commercial felling has been much lower, accounting for approximately 10 million cubic meters annually (Leppänen et al. 2005). When the additional commercial felling of 10 million cubic meters is multiplied by the average value of timber to the national economy (140 euro/m³) (Juurola et al. 1999), it can be estimated that the past support to NIPF has resulted in an approximate 1 400 million euro annual increase in national GDP (Leppänen et al. 2005).

From the national economic point of view it is evident that the past public support to NIPF has been very profitable. Assuming that the value of additional forest growth in the future will result in similar impacts to the national economy as it has done in the past, it can be concluded that the intentional impacts of public financing to NIP forest owners, i.e. to support national economic growth, will be met.

Public financing of NIPF strongly guides forest management practices and forestry investments. Though the public financing of NIPF forms the cornerstone for the profitable and sustainable management of forests, it also largely regulates forestry and the behaviour of forest owners. The unintended result is that most forest owners follow rather similar forest management practices, though the owners' objectives considerably differ and though the unified behaviour may form a barrier for finding new forestry opportunities and innovations.

What could be done to increase positive impacts or decrease negative impacts?

Public financing primarily aims to increase the financial attractiveness of forestry investments rather than directly promoting entrepreneurship in forestry. A major problem with these subsidies is the high cost in administration. In addition, the strong public organizations are influential in the markets which may prevent public entrepreneurship in forest owner services (Kolström and Harstela 2005).

3.3. Iceland – private property and recreation

What is the Government legislation or policy/projects that are impacting private forestry?

Public expectations and subsequently the legislation (including liability) regarding access to land are often based on traditional lifestyles that no longer exist. This is the case of 'everyman's right' found in many European countries and one guaranteed in the Nordic countries. Historically such access was necessary in many areas for pasturing and moving livestock and facilitating travel in general.

The rapid urbanization of industrialized countries has placed additional demands and pressure on surrounding urban lands. Forested areas primarily planned and managed for timber production are now required to provide ecological and social benefits that can severely limit the profits that would otherwise be gained through timber production. One of these changing demands is the increasing demand for recreational areas, especially near urban areas. This trend is most pronounced in countries with a high population density such as Denmark and the Netherlands where forested areas within acceptable distance of population centres are almost non-existent.

What is the nature of the impacts?

State agencies providing these services have limited resources to increase areas for recreational use. The vast majority of forested land is privately owned. This makes it desirable to turn to the private sector to satisfy demands for forest lands to supply education, health and recreational benefits. However in the present environment existing legislation can prove a hindrance to entrepreneurial development as illustrated by the following case study.

The eastern part of Iceland is in high demand for recreational opportunities. This could provide rural landholders with an opportunity to open and develop their lands for recreational use. One couple in the area own a farm with high potential for such an endeavour. The land is in a mountain valley containing a large tract of native birch forest and a trout river flows along the valley floor. The land is strategically located enabling them to draw from both foreign and domestic tourist groups. The couple are highly respected craftsmen and have a workshop and small gallery on the premises. They decided to expand their gallery and offer both camping sites and small cabins during the summer months. This venture had been quiet successful and the owners had plans for continued expansion and improvement to their facilities.

Are the impacts intentional or unintentional from the policy, legislation or project?

A few years after the area had been opened, some of their guests decided to drive up a trail that although not connected to, or part of the improved area, is relatively close. The trail was made by the local utility company and intended for use in maintaining power lines. The trip up the mountain resulted in an accident that did considerable damage to the car and injured one of the occupants.

Although the track was not made by the landowners, nor was their permission sought by the persons using the track, the owners were by law liable for all damages.

The people who were using the tract were fully in their rights because of the law of Everyman's Right. The owners pursued the case in court. The law is however quiet clear regarding liability in such cases and the couple were forced to pay a considerable amount in damages.

What could be done to increase positive impacts or decrease negative impacts?

Profits from such enterprises as the one discussed above are relatively low, and the price of insurance in such cases prohibitively expensive. When landowners are held liable for damages and are not compensated in any way for the intrusion on their privacy or damages caused by the user, there is no incentive for them to welcome the public into their forests. In fact, the opposite is true – it is to their advantage to actively discourage any public access.

Legislation must reflect current conditions within the society including land use. It is therefore imperative that the laws be reviewed and changed to reflect new demands and changed lifestyles of the people. Changes in these laws that would enable owners to be compensated for the inconvenience they experience, damage to their forest land caused by users and for performing tasks such as picking up litter left by the users. Forest owners also need to be protected from liability suits or insurance made available that would protect them. Changes of this type would allow for at least a partial realization of the social benefits for private forests demanded by increasing urban populations.

3.4. Bulgaria – “Lifeline of Europe” – Benefits of biodiversity protection in conflict with poplar plantations on Danube Islands

What is the government legislation or policy/projects that are impacting private forestry on Danube Islands within Bulgaria?

The Danube-Carpathian region is subject to a number of key threats, including but not limited to:

- The loss of wetlands and floodplains through drainage for marginal farms.
- The loss of land to introduced tree species for industrial forestry and urbanisation.
- Engineered developments have led to flood protection works being constructed with extensive channels.
- Crises and disasters through war and industrial chemical spills
- Nutrients from agriculture (50 %), waste (25 %) and industry (25 %) creating eutrophication.
- Contamination through insufficient river capacity to absorb municipal and industrial wastewater and hazardous chemicals.
- Unsustainable rural development including over-grazing, deforestation and poaching.
- Land restitution and privatisation leading to strategies of short term gain regardless of the longer term consequences, examples include cropping on unstable slopes and non-sustainable forestry.
- Lack of financial and technical support because of weak legislation in parts of the region, with challenges with corruption, illegal logging and the inability to deal with cultural issues.
- Unsustainable tourism creating concerns and consideration of how to promote sustainable tourism in mountain areas. There remain concerns about unsustainable practices, and the risks of over-development of certain areas and opening up natural areas that should be set aside for nature conservation (WWF Danube-Carpathian Region website, no date).

While there is recognition by the government of the need to address the environmental degradation and protection of specific biodiversity of islands in the Bulgarian Danube Basin, there is also pressure on the government for increased industrial forestry to be carried out, utilising the islands as poplar plantations.

What is the nature of the impacts?

The islands within the River Danube can play a critical biodiversity role, with indigenous trees, shrubs and plants creating important habitat for many species already under threat. While there is a desire to protect and even enhance biodiversity and habitat conservation, there is growing pressure to plant poplar plantations on the islands to support the forest sector. The intent to establish poplar plantations would directly impact biodiversity values on the islands.

On the other hand, the nature of impacts has to be also considered within the perspective of the River Danube as the “future central axis for the European Union”. The government legislation or policy/projects of any country on the River Danube have to be understood as part of a common effort towards achieving positive impacts on environmental degradation, as well as a specific effort to create a biodiversity tourist destination. The results of a survey on the benefits of preserving natural forests in the islands of the River Danube indicated that the conservation of natural forests can be a source of higher benefits than the replacement of natural forests with poplar plantations (Danchev 2002).

Are the impacts intentional or unintentional from the policy, legislation or project?

There is a combination of both intentional and unintentional impacts from the competing policy, legislation and specific projects addressing the islands. The intent of maintaining or enhancing the natural habitats on the islands is focussed on trying to maintain and enhance biodiversity values in a region recognised as being severely degraded and under tremendous social, environmental and economic pressures. The intent of establishing poplar plantations is primarily to create feedstock for the forest sector, with potential benefits through mills having a more secure supply of logs and thus supporting employment in the forestry sector.

The case of Bulgarian Danube islands is very indicative as an example of the problems emerging with the growth of industrial forestry when it is not regarded as a complement to the natural forestry.

The tourism sector will be impacted both positively and negatively by either approach. Maintaining and enhancing the islands habitats would promote better biodiversity, and enhance the environment while also creating the ideal natural aesthetic landscapes. Tourism, if it were to benefit, would ideally have to be carried out in a sustainable fashion, and the benefits from the tourism sector would meaningfully contribute to the local communities located in the area. Ideally there should be compensation paid to private forest owners with holdings on islands for their efforts of maintenance of natural and healthy forests. On the other hand, poplar plantations would assist the forest sector, which is one of the sectors seen to create economic growth and employment in an area facing serious social challenges. Communities with diversified employment and economic activities are often more stable than those dependent on a single sector (Mitchell-Banks 1999).

There is also an important international aspect to this dilemma for the Bulgarian government, as any decisions that they have will have repercussions for the entire

Danube Carpathian region – especially for those countries that are downstream. The common interest could be the implementation of joint programmes for developing the River Danube and its islands as a common European tourist destination, with a specific focus on biodiversity. The international focus on the Danube-Carpathian region, particularly through the larger-scale programmes including organisations such as the World Wide Fund for Nature in cooperation with governments, industries, other NGOs and communities is indicative of the massive scale and scope of the challenges and opportunities in the entire area (WWF Danube-Carpathian Region website, no date).

What could be done to increase positive impacts or decrease negative impacts?

The WWF Danube Carpathian Programme team describe the Danube as the ‘Lifeline of Europe’, and state specifically,

- Flowing 2 857 km from Germany’s black forest to the Romanian and Ukrainian Danube delta by the Black sea, the Danube is Europe’s only major river which flows west to east – from the member states of the European Union through the former Eastern bloc countries of what is now Central and Eastern Europe (CEE). The European Commission now recognizes the Danube as the “single most important non-oceanic body of water in Europe” and a “future central axis for the European Union”.
- The Danube basin is home to a diverse system of natural habitats. Among these are Germany’s Black Forest, the Alps and the Carpathian mountains, the Hungarian Puszta plains, the Bulgarian islands and the giant reed beds and marshes of the Danube delta. These habitats are home to a rich and unique biological diversity and species. The Danube river basin has more than 100 different species of fish – including five sturgeon species – and it is home to rare birds like the white pelican, white-tailed eagle or black stork.
- The 600 000 ha Danube delta empties into the Black sea near Romania and Ukraine and is a UNESCO World biosphere reserve with the largest reed bed in the world. A unique mixture of canals, reed beds, lakes and ponds, allows this Delta to shelter over 280 bird species. 70 % of the world population of white pelicans and 50 % of the populations of pygmy cormorant and red-breasted goose can be found in the delta.
- The floodplains of the Lower Danube are areas with outstanding biodiversity, providing multiple functions and benefits such as: biodiversity conservation,

water purification, pollution reduction, flood protection and support for socio-economic opportunities such as fishery and tourism.

- About 83 million people live in the basin and more than 20 million people depend directly on the Danube for drinking water – primarily groundwater from domestic wells. The basin also unifies and sustains a wealth of diverse cultures and traditions.
- Until the end of the 19th century, the Danube was a wide branching river with an extensive network of tributaries and backwaters. Nostalgically referred to as the Blue Danube, its course was always changing and it had a dynamic natural exchange with its floodplains. Since then, drastic interventions to the Danube system's natural flow and surrounding lands, to improve flood protection, agriculture, power production and waterway transport, have destroyed over 80 % of its vital and valuable wetlands, floodplains and forests. A large decline of biodiversity has been experienced including the loss of numerous fish breeding holes, especially for sturgeon which now only survives in remnant populations. Black poplar trees originally flourishing in floodplain forests are all but gone, while beavers disappeared long ago. Such developments have devastated the health of the river, affecting wildlife and the food, water and raw materials needed by all.
- It has to be acknowledged that there is little public awareness about how 40 years of communism in Central and Eastern Europe resulted in both positive and negative effects for the middle and lower reaches of the river. It is true that many wetland areas were unwisely drained to support unsustainable agricultural and forestry practices, in parts of the Danube delta. But at the same time, many natural areas remained untouched. During those four decades, unsustainable development in many parts of Western Europe led to the loss of numerous habitats and species – many of which have been preserved in CEE (WWF Danube-Carpathian region website, no date).

This description of the scenario that exists for the area offers caution but also ideas of how to turn the situation from one of adversity to advantage. Rather than forestry focussing on just fibre production an alternative type of forestry could be pursued. More nature-based forestry practices could be promoted and supported to assist the forest sector while minimising impacts on biodiversity, natural processes and habitat and biodiversity values as well as on tourism which is heavily dependent on

attractive landscapes. Improved habitat conditions will increase water quality and thus fisheries.

Reconstruction or remediation of island habitats can also serve as an important flood mitigation tool. Funding mechanisms that recognise and reward the maintenance of habitats and species that have been reduced or extirpated in Western Europe could be pursued. These are just some of the alternatives that could be pursued to support positive impacts and better mitigate negative ones.

The positive impacts of a tourism and recreation sector have been determined by a Contingent Valuation study (Danchev 2002). The results of the study indicate unambiguously multifaceted positive economic effects of conservation of the natural forests in the Bulgarian Danube islands. They demonstrate relatively high willingness-to-pay in favour of restoration of natural forests on the Danube islands, which is expected to pull the development of tourism and recreation, commercial and non commercial fishing and hunting. It is expected that the growth of revenues from activities stimulated by biodiversity conservation, such as for tourism, recreation, etc., will compensate the decline in revenues from the reduced logging of timber from the poplar plantations.

In this respect, it is important to more effectively implement the strategy for the protection and restoration of flood plain forests on the Bulgarian Danube islands, which is to stop the replacement of natural forests with industrial forests and engage in natural forest restoration.

The impacts of government legislation and policy or projects on private forestry and private management are of great importance to address environmental degradation as illustrated in this Bulgarian case study. Their efficiency depends on how well national strategy priorities for long term forestry development are defined. In some cases positive impacts on private forestry development could be achieved through the common policy of several countries participating in internationally jointly funded projects.

3.5. Italy – Problems facing entrepreneurial forest development in Central Italy

Introduction

The development of forest enterprises in Central Italy faces a variety of problems, with challenges created from the indigenous forest profile (predominantly coppice) and the lack of competitiveness with similar timber products from abroad. Forests in Central

Italy are grouped along the Apennine Mountains, in a band 500 to 1800 metres above sea level. The landscape is uneven, characterised by mountains and hills with sharp slopes, with fertility levels declining with increasing altitude.

Flora in the region exhibits a wide diversity, with deciduous species being predominant. The most common species is oak, in particular Turkey Oak (*Quercus cerris* L.) and Pubescent Oak (*Q. pubescent* Wild). In keeping with its natural properties this oak forest was managed with a rotational growth cycle of 40 to 50 years, and the timber was used extensively for the production of railroad sleepers. With the development of concrete sleepers, timber railroad sleepers went into rapid decline and a comparable market outlet has not yet been found. The larger part of these forests has reverted to coppice with a shorter rotation period and products mostly destined for use as wood fuel. At the moment, the forest in Central Italy produces more than 50 % of the total nation's wood fuel - a product with a very low unit value.

What is the government legislation or policy/projects that are impacting private forestry?

There are legislative challenges as well as the challenges of fragmented and absentee ownership, and an inadequate road network between the forests in the mountains and the processing plants on the plains (which results in high transportation costs). Forests have always been considered as having a particular social value. The first national law for the protection of forests and the safeguarding of hydro-geological resources was introduced in 1877. Successive legislation (RDL 3276 / 1923) established norms of forestry practice (a forest code) and assured minimum standards of forest management, while trying to combine production objectives with the safeguarding of natural resources.

The growth of environmental awareness has led to numerous laws for the protection of the environment at European, national and regional levels, creating new requirements for forestry management. Significant examples are the Protected Areas and Nature Network 2000, which concerns large forest areas, something in the region of 60 % (Corona and Marchetti 1998). Recent updates and revisions at the regional level of forest codes are designed to promote practical and assured standards that harmonise production objectives with the safeguarding of landscape and hydro-geological resources, specifically issues surrounding biodiversity, the countryside, animal habitat, etc.

Along with the large number of environmental measures already in force, another significant characteristic is the lack of coordination and the absence of proper guidelines for their implementation. This is compounded by the fragmented nature of jurisdiction across various institutional levels, and at the same institutional level between different offices. This leads to uncertainty over the outcome and the time necessary to conclude any administrative program of implementation.

What is the nature of the impacts?

The overall administrative trend towards environmental priorities has progressively introduced both temporary and permanent obligations and restrictions on forestry activity, generating uncertainty among owners as to their right to cut the forest. These uncertainties force forest owners to proceed in a manner that minimises risk and harvest at the minimum cycle required by law. This is particularly true of medium to small forest farms which only periodically undertake a final cutting with such low unit values for their products.

This lack of planning has characterised the forestry sector since the first and only National Forestry Plan of 1985. This should have been a tool for providing coherent development guidelines connecting forestry and the environment, reinforcing the 'forest to wood to furnishings product chain', and for the integration of environmental and production objectives. Instead, it has not been able to make significant inroads due to restraints placed on financial resources, the general unavailability of funds and the absence of any continuity (Corrado and Merlo 1999; Pettenella et al. 2005).

Forestry planning is today a regional prerogative. It is implemented and sustained by public contribution through the Rural Development Plan 2000 – 2006 (Reg. 1257/99), and by the subsequent plan now being compiled 2007 – 2013 (Reg. 1865/2005), which has an even better chance of making inroads into the sector. A wealth of environmental values are often borne out at the level of territorial planning, but unfortunately are often presented in a fragmented manner across various institutions, not always accessible or properly coordinated. This makes it difficult for forestry concerns to operate effectively. They often find themselves in an uncertain context with regard to what is considered the current, everyday practice in the area.

Are the impacts intentional or unintentional from the policy, legislation or project?

There is a combination of both intentional and unintentional impacts from the competing policy, legislation and specific projects in Italy. There has been a deliberate effort to attempt to address environmental concerns, but the delivery of forest management

has been fragmented as has the ownership, and there is a low economic political profile and inadequate state funding to invest in the sector. Failing to see the entire context of the forestry challenges results in piecemeal legislation and administration. This legislative and administrative inconsistency results in uncertainty for the private forest owners, and leads to them undertaking the minimum amount of management on their land to reduce their risk.

What could be done to increase positive impacts or decrease negative impacts?

The forest system in Central Italy presents several factors (fragmented and small parcels, absentee landowners, low value coppice, long distance and high transport costs from forests to processing plants) which intrinsically reduce its market competitiveness. To the already difficult situation in which forestry businesses find themselves can be added the need for running businesses which conform to existing environmental values. The simplification and uniformity of the forms of cultivation, combined with the strong family traditions that inform their choices and the absence of qualified labour, makes it difficult for them to adapt to the various demands of the environmental situation

For various reasons the current economic situation arises from short term policy priorities, even for owners of public estates. Public officials responsible for decision making are faced by many pressing demands on the public purse which make it difficult to adopt long term policy goals. It is evident that a more far reaching policy needs to be introduced, but given the forestry sector's small contribution to the national economy, it is unable to attract the resources needed to solve its serious problems. Resources are more likely to come from social and environmental issues that surround forest ecosystems than from traditional wood production. In this context, timber production can no longer be the sole aim of forest management by entrepreneurs, but must recognise the value of activities other than wood production, such as the various commodities and services that come from forest ecosystems. The fragmentation of forest ownership must be overcome, introducing a wider range of management methods that take into account the multiple use of this valuable resource.

4. CONCLUSIONS

While there is a common ground for much of European forest legislation and policy, the impacts on private forestry can vary tremendously between the many countries. This may be a reflection of the scale and scope of the legislation, but as importantly

driven by unique social, economic and environmental concerns. These concerns may not only include historical use, but also clarity of legislation, conflicting legislation between various ministries, or even issues such as liability as demonstrated so clearly in the Icelandic case.

The case studies have also revealed the need to address any legislation, policy or projects in a very informed and coordinated manner. Governments need to be aware of how the following concerns need be understood and addressed:

- What is the scale and scope of their national legislation?
- What is the origin of the legislation and does it still address issues that exist to the same degree that they did at the time of the legislation being drawn up? If not, is there an ongoing review of legislation and policy to ensure that it remains relevant?
- In what ways does this legislation determine policy and projects? Is this seen to be effective? Are there means to make it more effective?
- Where and how does any legislation or policy and resulting projects work at odds with each other? Does one ministry or department end up working against the other? How is conflict addressed and avoided in the future?
- If there is conflicting legislation and policy, is there a clear delineation of what is the suzerainty or ranking of the various legislation and policies?
- Is there constant monitoring of the implications of legislation, policy and projects to see if the desired impacts or effects are achieved? If undesirable results are determined, is there a manner to mitigate or remediate them?
- How is the legislation and policy coordinated and administered?
- Are there adequate staff and financial resources to ensure that legislation and policy are administered in a consistent and equitable fashion for all?

The case studies have given us some insights into some challenges faced across Europe. Norway faces high costs and difficult forestry in an increasingly global market with a growing absentee forest ownership base and a recognised need to undertake and to be seen as practising sustainable forestry. Finland faces challenges on how to make the financing of forestry more administratively efficient but also in such a manner as to promote innovation and entrepreneurship. Iceland is not only undergoing extensive afforestation but also now facing growing demands for forest recreation in the peri-urban forested areas. Countries such as Bulgaria face significant challenges in addressing social, economic and environmental needs in areas such as the Danube

Basin. The government faces real challenges to create economic opportunity, support communities and maintain the environment in a river system that is not only highly impacted but also the subject of a lot of international focus. Forestry in central Italy faces a range of challenges including onerous and inconsistently applied forestry legislation, inadequate funding for forest administration and management, fragmented ownership of forests with low economic values and located in areas difficult and costly to access. Trying to establish a competitive forestry sector represents a tremendous challenge.

The world is ever-changing, and this is especially challenging for foresters who typically have long-time horizons and periods to wait to recoup investments in silviculture and forest management. All of Europe faces changes in populations, urbanisation, increasing wealth and a growing desire for leisure, recreation and seeing greater social and environmental services from the forests. Effective legislation, policy and specific projects can significantly assist in addressing the ongoing challenges and to ensure that sustainable forestry contributes to a more sustainable world. The challenge is to devise effective legislation and policy and to effectively administer it, and to monitor how it impacts not only targeted sector or region, etc., but to also be aware of what externalities it may create and to be prepared to address them when needed.

REFERENCES

- Arnesen, T., Trude, H.E., and Jørund, A., 2004. *Levende skog prosen – fortid nåtid og framtid. En evaluering.* Øslandsforskning. ØF-rapprt nr 16/2004.
- Barstad, J. and Mitchell-Banks, P.J., 2005. The 'shadow' Norwegian forestry programme. Case study 1: The living forests program & Case study 2: Summary case studies description. An internal paper prepared for the GoFOR Programme.
- Bauer, J., Kniivilä, M. and Schmithüsen, F., 2004. UNECE. United Nations Economic Commission for Europe. Geneva timber and forest discussion paper 37. *Forest legislation in Europe: How 23 countries approach the obligation to reforest, public access and use of non-wood forest products.* United Nations, Geneva.
- Corona P. and Marchetti, M., 1998. Forest data and information requirement for Italian designated conservation areas. In: *Forest management in designated conservation and recreation areas.* Firenze, 7-11 October. Pp. 265-275.
- Corrado G. and Merlo M., 1999. The state of national forest programmes in Italy. In: Glück, P. Oesten, G., Schanz, H. and Volz, K-R., (eds.). *Formulation and implementation of national forest programmes. Vol. II. State of the art in Europe.* EFI proceedings 30. Pp. 157-174.

- Danchev, A., 2002. Economic benefits of biodiversity conservation: Case study of the Bulgarian Danube islands. *Economic Thought XLII (4)*. In Bulgarian.
- Juurola, M., Ollonqvist, P., Pajuoja, H. and Toropainen, M., 1999. Outcomes of forest improvement work in Finland. *Silva Fennica* 33(3):217-224.
- Kolström, T. and Harstela, P., 2005. Puuntuotannon ja -korjuun tulevaisuus: Metsäalan tulevaisuusfoorumi – työryhmäraportti, metsänhoidon ja metsäteknologian yhdistetty työryhmä. Joensuun yliopisto, metsätieteellinen tiedekunta. Tiedonantoja 161. 97 p.
- Leppänen, J., Piiparinen, H. and Hänninen, H., 2005. Evaluating financing of forestry in Europe (EFFE): Country level report – Finland. 192 p.
- Leppänen, J. and Vatanen, E. 2004. Metsänparannustoiminnan kansantaloudelliset vaikutukset. In: Aarnio, J. (ed.). Julkinen tuki yksityismetsätaloudessa. Metsätutkimuslaitoksen tiedonantoja 923:79-94.
- Living Forests Process Website. No date. http://www.levendeskog.no/html/e_Competitive%20climate.htm
- Mitchell-Banks, P.J., 1999. Tenure reform for facilitating community forestry in British Columbia. Unpublished Ph.D. thesis at the University of British Columbia.
- Mitchell-Banks, P.J., 2005. The challenges faced by small-scale farm forests in the changing Norwegian and European environments. Presentation at IUFRO conference on Small-scale forestry in a changing environment. May 30 - June 4, 2005, Vilnius, Lithuania.
- Mitchell-Banks, P.J., 2006. The evolution of small-scale forestry in Norway and its changing impacts on ecosystem health and the economic viability and societal well-being. Challenges faced by small-scale farm forests in the changing Norwegian and European environments. Presentation at IUFRO conference on Small-scale forestry and rural development: The intersection of ecosystems, economics and society. June 18 – 23, 2006. Galway, Ireland.
- Øistad, K., No date. <http://www.forest.joensuu.fi/barents/data/pushkino%20oistad.doc>
- Pettenella D., Klohn S., Brun F., Carbone F., Venzi L., Cesaro L. and Ciccacese L., 2005. Italy. In: Jáger, L. (ed.), 2005. Forest sector entrepreneurship in Europe: Country studies. *Acta Silvatica & Lignaria Hungarica*. Special Edition 2005: 383-431.
- WWF Danube Carpathian website. No date. http://www.panda.org/about_wwf/where_we_work/europe/what_we_do/danube_carpathian/blue_river_green_mtn/threats/index.cfm

II Wood processing industries

ENTERPRISE DEVELOPMENT IN THE FOREST SECTOR THROUGH SMES IN WOOD PROCESSING INDUSTRIES USING LOCAL FOREST RESOURCES

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SUMMARY

This paper aims to build a synthesis on the Working Group 2 contributed subgroup papers listed:

- Rummukainen, A., Brogt, T. and Kastenholz, E. 2005. Challenges for forestry contractors: Various structures but mutual problems in Finland, Germany, Poland and Romania. Pp. 149-174.¹
- Rimmler, T., Cooper, R. and Ollonqvist, P. 2005. Market entry barriers, strategies and innovation in industries of the structural wood product supply chain. Pp. 175-233.²
- Cesaro, L., Florian, D. and Padureanu, L. 2005. Delocalization of wood working industries to Balkan Countries: analysis of statistical data and case studies. Pp. 234-252.³
- Ollonqvist, P., Teder, M., Lahinen, K. and Viitanen, J. 2005. Delocalisation of wood processing industry from Finland to the Baltic countries. Pp. 253-277.

1. FACTORS AFFECTING THE COMPETITIVENESS OF FOREST WOOD / NON-WOOD ADDED VALUE CHAINS

Forestry is among the major sources of the economic sustainability in rural development and a key activity to feed up the value chains and value creation based on rural resources. The income flow upward from the forest product markets to the rural communities is the tool towards the multiple wealth creation, financing for the innovative initiatives and development of these communities. Value chain is a unified

1 The paper was contributed by Krzysztof Jodlowski (Polish Forest Research Institute, Poland), Thomas Rimmler (Finnish Forest Research Institute, Finland), Dariusz Zastocki (Warsaw Agricultural University, Poland), Barrie Hudson (European Network of Forest Entrepreneurs, Scotland) and Leonard Padureanu (Ministry of Forestry Romania, Romania).

2 The paper was contributed by Dainis Daukstra (Cefncoch, Wales) and Anders Q. Nyruud (Agricultural University of Norway, Norway).

3 The paper was contributed by Diana Ivanova (University of Forestry, Bulgaria) and Aidas Pivoriunas (Lithuanian Forest Research Institute, Lithuania)

downstream source of income creation from the viewpoint of local resource use. The share of local value creation in the chain can vary from case to case.

The identification of the vertical wood based value chains down to the final consumers and corresponding major markets are important towards the cohesion in the value creation as well as to identify the new potentials to competitive advantages (CAs). Entrepreneurship as well as network and co-operation solutions provide best potential CAs towards competitive value chains.

The major potentials for new small and medium sized entrepreneurship in wood product value chains can be identified in secondary wood processing industries. Those related to wood harvesting, transport and procurement imply structural changes in the market and those in primary wood product industries imply tailor made wood supply based value chains. CAs in wood product industries, as low-tech industries, imply use of positive scale economies or focused value chains from the wood resources up to the secondary wood processing. The competitiveness of SMEs depends, besides the actions of the individual firms, on the comprehensive value creation in the chain. Entrepreneurs must support the progress in the added value creation of the whole value chain concerned, parallel with the development of their own business.

The major value chains in wood product industries are in wood frame construction and wood-based bioenergy respectively what concerns their source as rural incomes from forest resources. Timber frame construction and its link into domestic construction as well as virgin plus recycled wood streams into bioenergy generation and timber harvesting were covered in the subgroups of Work Group 2 ("Human development, niche production and innovation related to SMEs in wood processing industries using local forest resources") of COST Action E30. The delocalization of production plants or even whole industries both in primary and secondary wood production industries were discussed as issues related to the creation of added value in the value chains.

Forestry contracting

Majority of the issues characterizing business infrastructure in forestry contracting are impeding what concerns profitability, business growth opportunities and options to new entrepreneurship. Deteriorating profitability is a common problem among forestry contracting firms throughout the European countries. Wood delivery prices are stagnating or remaining constant at the same time when all costs are growing higher. Forest harvesting and transportation business is frequently called survival what concerns the quality of business. The latter impedes the entrepreneurship

through low credit rating and consequent high interest rate (because of the credit risks). SMEs in the business have limited options to internal financing because of the low profit margins. There are large country specific deviations, however, from the benchmarking determined by the Scandinavian countries.

Ergonomic problems caused by long working days and stressing, alone working conditions are among the reasons behind the constant shortage of employees in logging and forest transportation. Many forestry contractors are well trained in mechanics and may have completed even forestry schooling. They are, however, frequently equipped with inferior managerial and business skills, which when accompanied by shortage of own assets, impedes entrepreneurship and investments to modern machinery. There are growing challenges related to customer needs in wood processing industries what concerns precision of deliveries. Public governance has raised awareness related to sustainable forest management meaning to forestry contractors more and more restrictions and regulations, which are e.g. laid down in forest certification schemes. Forest operation management must meet environmental and ecological requirements without reflections through higher prices under increasing costs.

Wood product industries supplying wood frame construction

Business performance in low tech industry firms under competitive product and input factor markets are predefined by factors originating in the external environment of the firm. The latter is true in majority of primary and secondary wood processing industries respectively. Resource based and competence based view on the sources of the competitive advantages of the primary wood processing firms concerned probably provide a better description of the real world than innovativeness and superior business concepts. The latter is due to the position of basic, standard products dominating in the portfolio and being sold in the bulk product markets. The competitive advantage of primary wood processing industries, therefore, relies much on the well functioning production and management processes and related process technologies. Innovations are not only dependent on the technological opportunities available, but also rely on the performance of the innovation system and on a supportive regulatory and competitive environment.

The primary wood processing industries are dominated by basic production representing low technologies. Firms are weakly integrated downflow in the value chain towards structural timber products and system components. Traditionally, it has

been typical for every participant in the chain to develop their own independent value creation and concentrating to use the specific competitive advantages of their own

Wood product industry delocalization

Many forest sector enterprises, even the whole industry groups, have reallocated their production activities over the national borders. Delocalization has been driven, not only by economic forces, but also by social dynamics and strategic objectives. There are **two basic drives, markets and minimisation of production costs to delocalisation**. Delocalisation decisions are in the long term strategy of large multinational companies more it generally applies to large companies or multinational companies (see **Delocalisation of wood processing industry from Finland to the Baltic countries**). However, some small/medium size enterprises have started their delocalization activities in dynamic markets as a part of adapting to global market competition in the wood and furniture sector (see. **Delocalization of wood working industries to Balkan Countries**).

Three types of delocalization are identified in the subgroup:

- **Local specialised centres: mainly outcomes from autonomous growth of existing, local, traditional craft business** characterized by the dominance of SMEs but also from the decentralisation of developed/structured industrial areas. In the latter case low costs of production can be traced behind those delocalisation activities. **The less technological phases of the value chain** can be delocalised into these local specialised centres
- **Industrial districts: characterized by the integrated SME networks**. The individual SMEs in the mutually related network can acquire the CAs to participate more resource requiring businesses. Benefits from delocalization to industrial districts come from diversified but qualified knowledge base in the vertical value chains of the industrial districts
- **System areas (cluster): provide business platform for highly specialized firms and access to international markets**. Delocalization solutions, by multinationals imply takeovers but also provide options for the SMEs commanding superior technology knowledge.

The word “internationalization” implies several meanings (foreign trade, Foreign Direct Investments – FDI, outsourcing, subcontracting, etc.) but emphasis in the papers on delocalization have been given to FDI, due to the fact that traditional statistical sources mainly refer to FDI. The differences in production costs among the

European countries promote delocalization that in turn decreases *ceteris paribus* the international roundwood trade. Horizontal and vertical types of FDIs are discussed here. The former one relates to the international diversification of sawmills using imported roundwood and allocating production along cost minimization principle. The latter one is related to the vertical delocalization of upflow units of wood product value chain. Both types have tangible input factor conditions pushing delocalization investments.

2. BARRIERS TO ENTREPRENEURSHIP

Forestry contracting

Typical forestry entrepreneur acts as a harvest and transportation contractor to a single or a few buyers. Harvest entrepreneurs are dependent on these contracts due to the minimum annual harvest volume that the entrepreneur must acquire to have his business profitable. The latter effectively restricts options to the entrepreneurship based on simple market transactions without permanent contracts. Only a small minority of forestry entrepreneurs is independent from permanent delivery contracts and only a few of these entrepreneurs are business oriented with procurement activities included in their business.

The structure of forest contracting business depends on the wood purchasing structure in the area concerned. The competition among the contractors is typical in countries where the buyer structure covers many SME's as timber using industrial firms or trade middleman. There are potentials to the positive economies of scale in different dimensions of the business available to forest contracting. These economies provide competitive advantages to the existing entrepreneurs supporting expanding investments to meet the critical mass related to scale economies.

The new entrepreneurship potentials are mainly available in the virgin markets where new timber resources are introduced. The low rate of profits makes the business uninteresting to capital investors and implying large internal financing to investments. There are barriers to entrepreneurship in wood harvest contracting, besides the ordinary barriers to entry (or exit) the business, barriers to run the business or even barriers in entrepreneurial thinking and business inabilities: in customer relationships or business recognition.

Wood product industries supplying wood frame construction

CAs in primary wood processing entrepreneurship are frequently acquired through the market penetration of the present product portfolio. The major CAs are available in input purchasing conditions and customer services and minor ones in core product performance. The major CAs of primary wood processing (sawmills, wood plates, etc.) industries are in the economies of scale. This fact excludes options to new entrepreneurship as independent business except in a few special cases. Specialization can be developed through specific demand segment (based locality, special requirements, etc.) penetration or through the upflow or downflow integration (e.g. through networks) in the vertical value chain.

The manufacturing of secondary wood processing products supplied to wood frame construction indicates a low degree of prefabrication and a low degree of integration into construction as its client industry. The platform type of sub-product and component specifications both in national but especially in EU market level impede the growth of supply (in the form of medium sized companies or networks of small producers) to create supply base for construction companies and drive product development according to the perceived needs of their clients or final consumers. The wood product manufacturers have less contact with on-site operations than what is typical within the concrete industry companies. In the latter, firms as subcontractors provide their components directly to the builder industries.

Wood product industry delocalization

Business delocalization means a transfer of existing production potential from one area to another. There are two principal options to a new entrepreneurship related to delocalization: a) the reuse of the production factors and facilities in the delivering area and b) the subcontracting and residue utilizing entrepreneurship in the area receiving delocalization. The expansion in the local product market has turned out to belong to the major reasons of delocalization only in few cases. There are different types of delocalization related to vertical wood product value chains. The new potential uses of forest resources provide options to timber or non timber entrepreneurship in the delivering area if delocalization is due to the costs of production with parallel roundwood use transfer. The typical case, however, means that production capacity is delocalized to the area of the prior roundwood import for primary wood product firms that of primary wood product supply for secondary wood product firms. The common case is correlation between the unit prices of roundwood and labor. Use of

sawmill residue provide entrepreneurship options in the delocalized areas and is in fact a transfer of this activity from one area to another.

Appropriability conditions can either inhibit or support the exploitation of technological opportunities. Appropriability might simply relate to market domination and barriers to entry, or complementary assets in the form of strong ties to suppliers and customers. The product portfolio of the sector as a low-tech industry is dominated by simple, non-complex mature products. The sector is seen to be in the maturity phase of its technology life cycle. In the short-run there is no sign indicating revolutionary break-through in technologies or products, which would profoundly change the competitiveness of wood products in the market.

3. PROBLEMS FOR ENTERPRISE DEVELOPMENT

Needs for tailor made wood supply

Forestry and wood product value chains differ from region to region in Europe. Partly they are rural based differences due to natural conditions, timber resources or ownership structures and even in some cases to industrial and business structures. Major concerns are in the markets and the urban demand respectively. The key competition in the markets can be identified between the input factor specific value chains. It is crucial to secure a high-quality wood material supply in the wood based value chains to maintain and strengthen the competitiveness of the European wood processing products. Improved wood-supply systems and forest management models are therefore needed. The links in the vertical value chains between forest owners and the secondary wood processing industries need more focus as well as the strengthening of the existing ones in most parts of Europe. The improvement of competitiveness in the upflow segments of the value chains imply raw material provisions, tailor made for various end uses and efficient and environmentally friendly harvest and forest transportation operations as well as managerial patterns for wood market actions (Forest-Based Sector 2006).

Forestry contracting

Wood markets are liable to rapid changes in wood processing industries, characterized by concentration processes and internationalization. The result is that wood processing industries demand larger amounts of wood than in the past, as processing capacities in single plants are increasing.

Market power of a single forest contractor is weak when negotiating on prices of contracts, equipments, fuel, spare parts, etc. These weaknesses support the establishment and restructuring of enterprises towards the multiple harvesting chain mode. This way the entrepreneurs can better allocate their machine capacity or adopt special machines, like thinning harvesters, tracked machines for slopes etc. into their portfolio. There are clear competitive advantages mainly through cost reductions achievable when harvested with special machines compared to harvesting with same medium size machines.

The harvesting entrepreneur can achieve CAs when contracting with an individual forest owner if he can provide all forestry tasks from logging to planting. This kind of enterprise can then produce all services by themselves or subcontract parts of the services to the other companies. There is empirical evidence on CAs in the form of niches as a substitute to the scale economies, where the small size of enterprise may even be beneficial.

Participation into the associations of harvest contractors can support entrepreneurship. Associations provide potential market power through coordinated public policy actions, professional training and schooling and coordinated research and development efforts. Association can elaborate tendering procedures and direct agreements, so that besides price, work quality, environment and reliability are taken into consideration as criteria to choose the best contractor.

Value chain -tailored supply accompanied with more effective operations and logistics are considered the potential sources for expanded added value in rural wood production. The full benefits for the end products could be achieved through novel wood-quality assessment based on latest IT -techniques in forest-operations and at production sites for early measuring and identification of raw-material properties.

Wood product industries supplying wood frame construction

Primary wood processing (sawing, cutting, slicing) industries involve very diverse processes for the production of semi-products in the vertical value chains concerned. New research in the downflow stages of these value chains can promote innovative products and production processes that fit better to the integrated production concepts along the value chains. Advanced sorting and grading systems for roundwood and advanced processing technologies provide options towards optimized material efficiency and more reliable production. Technology development can promote the use of new material concepts and secondary products. Processing techniques can

involve incremental innovations to be adapted to the specific requirements of novel products, helping to enhance material efficiency. The intake of new concepts (e.g. techniques making wood drying faster) to speed up production line would increase productivity and decrease energy consumption. Improved competitiveness is needed in the woodworking industries through cost-efficient and added-value manufacturing compared to non-wood raw material based value chains. The latter implies new generations of wood-processing technologies to be accessible for the production of high performance products.

Wood product industry delocalization

Business delocalization in wood product value chains is typically due to the tangible conditions related to low production costs or product market expansion. These targets were identified among the Italian firms but can be considered valid in other regions, too. Access to new timber resources is valid also what concerns delocalization done by the Finnish corporations to the Baltic countries. The CA targets on delocalization are typically derived from cost leadership objectives that in turn impede the establishment of new entrepreneurship. The receiving country can make supportive actions towards new entrepreneurship in their promotion of FDIs. Delocalization provides options in the first stage to SMEs able to use residues as their inputs and subcontracting when the delocalized units are becoming mature with their business to look for better cost efficiency.

The cumulated capability inside the firm to manage transnational production and the co-ordination involved support delocalization decisions. Strong SME networks have been able to maintain their global market CAs by concentrating their export market activities. However, firms in industrial districts tend to delocalise all their production stages abroad keeping whenever delocalizing and keeping only product design, quality control and marketing and the brand within their home district.

4. VALUE NETWORK COHESION SUPPORTS ENTREPRENEURSHIP IN THE EMERGING GLOBAL MARKETS

Enterprises in the primary wood processing industry can be characterized by mature technology and standardized products. This business infrastructure provides only small technological opportunities to acquire other competitive advantages but cost efficiency that in turn is possible to SMEs in exceptional cases. However, there might exist 'pockets of demand' in specific product niches e.g. in wood frame construction.

Part of the options can also relate to the recovery improvement and waste reduction. The latter are available by developing and investing into new sawing technologies (curve sawing or small log diameter sawing). Product policies focusing on product quality and further processed and customized products provide a second potential road towards competitive advantages.

Secondary wood processing industries provide new added value potential in conjunction with novel quality assessment techniques. The potential areas for development are identified in thermal smoothing, the application of specialized high performance cutting and planning tools, novel hardening and multi-functional protection techniques, innovative 3-D cutting and forming processes, improved gluing techniques and advanced processing of multi-composite materials. These advances provide basis towards more efficient wood use, improved product characteristics and new functionalities created by re-engineering particles, flakes, veneers, sawn timber or by chemical, thermal or mechanical modification technologies. There are needs related to the re-engineering the wood frame construction processes. The efficient and flexible manufacturing techniques applying wood-based products are among them.

There are niche dwelling house construction potentials available in business-to-consumer (BtoC) dwelling house construction segments and they tend to be the kind of business appropriate for value networks of SME's. The major challenge in these niche markets relates to costs of production that tend to be high because of the individual planning component production and need for high quality craftsmanship in assembling and installations. Otherwise strong market competition characterizes BtoC market segments in wood frame construction providing small opportunities for new entrepreneurship without new production or business innovation creation.

There is a great challenge among SME entrepreneurs and managers related to the effective use of mental capacities. The predominance in daily running of the going business in the managerial activities of small and medium size entrepreneurs allows them little resources towards the business strategy development. The latter is a big challenge when the current market integration and geographical expansion are concerned. Networks are the major mode in the creation of competitive advantages among SMEs in the growing markets. The actors and stakeholders promoting the formation of business networks towards the jointly acting SME's in the market of forest products can also promote new entrepreneurship supporting the emergence

of the necessary skills in these networks. There is currently too limited amount of integration solutions along the wood related value chains and the existing ones could benefit more from the growing expertise knowledge.

An increased share of wood-based materials in construction, family-houses and multi-story buildings implies novel building concepts (e.g. sound and thermal insulation, fire protection, hazard safety) to create competitive advantages for wood frame construction in single and multi-storey houses, dwellings and office buildings. Modern construction methods (e.g. pre-fabrication, gluing or joining at the construction site, system solutions) will speed up the building process and help to reduce building costs. Increased wood frame construction leads to a sustainable living environment and a better quality of life for European citizens. There are technical solutions available to take wood structures to be widely used for cost-efficient erection of large-scale constructions with high quality and standards. Multi-material solutions will lead to wood-based building products with improved properties in terms of strength, shape stability, and durability.

Timber frame house component entrepreneur has to adapt to the mainstream best practices in construction as well as adopt customer orientation in their supply chain management to outperform its competitors in BtoB markets. This requires of being on the forefront in adopting best practices in the construction process and in the management of related supply chains initiated and implemented by the construction companies. Options for new entrepreneurship in BtoB market segments are limited by the strong position of large construction companies in urban construction. These large construction companies, dominating the volumes of urban dwelling house construction, have their main business interests in the cost efficient subcontracting solutions. The profit margins in these subcontracts are typically low and restrict consequently the financial resources and possibilities to develop own product or process innovations. Timber frame house component producers need lively research and development activities toward new component and module specifications towards the market supply of these components.

Market matched wood resource production and supply are the key challenges towards the increased added value from the growing urban consumption. The local entrepreneurship in wood processing SMEs, for example, has traditionally relied on the domestic markets in their businesses. The enlargement of value chains on EU or global dimensions put much challenge on the local business infrastructures

of the SMEs. Reconnection of resource flow with harvest, primary and secondary wood processing has become a necessary condition to realize the potential returns from the high quality woodlands. Reconnection should be enlarged from the internal fitting of resource supply towards the formation of competitive wood based value chains. Typically the small businesses have little or no presence outside the local markets. The creation of value chains and also the modes of participation to emerging international markets must be actively promoted by national public agencies.

REFERENCES

- Forest –Based Sector Technology Platform. 2006. A Strategic Research Agenda. Brussels. 26 p.+ Annex 31 p
- Jaakko Pöyry International. 2004. Welsh Forest Industry - Mapping and Benchmarking the Forest Industry –Final Report. [http://www.forestry.gov.uk/pdf/walesjpcexecsummary.pdf/\\$FILE/walesjpcexecsummary.pdf](http://www.forestry.gov.uk/pdf/walesjpcexecsummary.pdf/$FILE/walesjpcexecsummary.pdf) [29.6.2006]

CHALLENGES FOR FORESTRY CONTRACTORS - VARIOUS STRUCTURES BUT MUTUAL PROBLEMS IN FINLAND, GERMANY, POLAND AND ROMANIA^{1,2}

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SUMMARY

Structural change in forestry, forest based industries and rural areas as a whole have a strong impact on forest operations and contractors who offer services in forestry. Even if harvesting is an important part of wood utilisation processes, forestry contractors are the weakest link in the chain, because they are small and micro enterprises in a more and more centralised and globalized market.

A comparative study was carried out between Finland, Germany, Poland and Romania, these four countries representing very different European regions, both in terms of natural frame conditions and in economic development and history. Statistical data and literature sources were used to describe different frame conditions and analyse mutual problem areas for forestry contractors' development.

Even if at the first sight the conditions in these countries are very different, particularly as far as forest ownership structures and particularly the standard of mechanisation is concerned, there are still general characteristics and common barriers to forest contractors' development. The most crucial problem is that contractors are in the weakest negotiation position against very large customers, be it industries in the Nordic countries or State Forests in Eastern Europe. Contract prices are in many cases not likely to result into any significant profits, thus allowing no investments in development. This is accompanied in all countries by a considerable lack of managerial skills among the contracting entrepreneurs.

1 The article is based on the findings from State-of-the-Art Country Reports of COST Action E30 on Forestry Contractors. Country Reports from Finland, Germany and Poland are available for download under: <http://www.joensuu.fi/coste30/WG2SG3.htm>

2 Contributions to the article were made from the COST E30 Working Group partners. Special thanks are due to the partners involved in the COST E30 Working Group 2, Subgroup 3 "Performance of forestry contractors", that were Krzysztof Jodlowski (Polish Forest Research Institute, Poland), Thomas Rimmler (Finnish Forest Research Institute, Finland), Dariusz Zastocki (Warsaw Agricultural University, Poland), Barrie Hudson (European Network of Forest Entrepreneurs, Scotland) and Leonard Padureanu (Ministry of Forestry Romania, Romania).

Based on the analysis, strategies for coping with the challenges are discussed, among which question whether growth or reactive security strategy is used, is of utmost importance. Research demand is outlined. While there is a crucial demand for contractors development to ensure a viable entrepreneurship for competitive forestry in the future, there is need for research and development in this sector, particularly to develop knowledge transfer strategies that reach this heterogeneous and fragmented sector and to achieve business models that enhance entrepreneurial skills and capacities, and that offer attractive employment opportunities for the future.

1. RURAL ENTERPRISES COPING WITH STRUCTURAL CHANGE

Harvesting, skidding, forwarding and transport are a central part of forest based production. Traditionally wood was processed locally or down stream of water ways, because wood is heavy and voluminous. Historically, felling was done in winter by seasonal rural workers and loggers, while skidding operations were carried out by farmers, who could provide horses or machines such as tractors with winches or trailers. But this has changed radically over the last decades. Already in the 1960s, forestry work started to become more and more professionalized and it was no longer just seasonal work. Tractors enabled terrain transportation of logs in summer time, thus allowing year round harvesting operations. But in fact, the use of machinery with increased need for capital also pressed to work year round. Figure 1 shows the role of forestry contractors in the forestry wood chain and their relations to customers (forest owners and wood processing industries) as well as to other forest related enterprises.

Over the past two decades forest owners found that contracting transportation and later mechanised harvesting is more profitable than owning the machines and hiring operators. Therefore today the vast majority of harvesting and especially terrain transport is made by forestry contractors. In Nordic countries these are mostly forest machine enterprises, in more Central and Southern Europe many enterprises still carry out mainly motor manual harvesting operations. Skidding is often still done with farm tractors. Diminishing employment in agriculture - due to vanishing agriculture or to shifting to more efficient and less labour intensive growing methods - emphasizes the significance of forest machine enterprises as employers in rural areas. Lower market barriers and harder international competition have challenged forestry and forest based industries as a whole by increased import and export of round wood but

also by moving the forest industry production to most economic locations all over the world. Local harvesting enterprises are now, or will probably be in near future, parts of an international business to business market, where the customers of forest operation services have overwhelming negotiation power both on work volumes and prices. Figure 2 illustrates factors leading to an increasing demand and new challenges of forest contracting businesses.

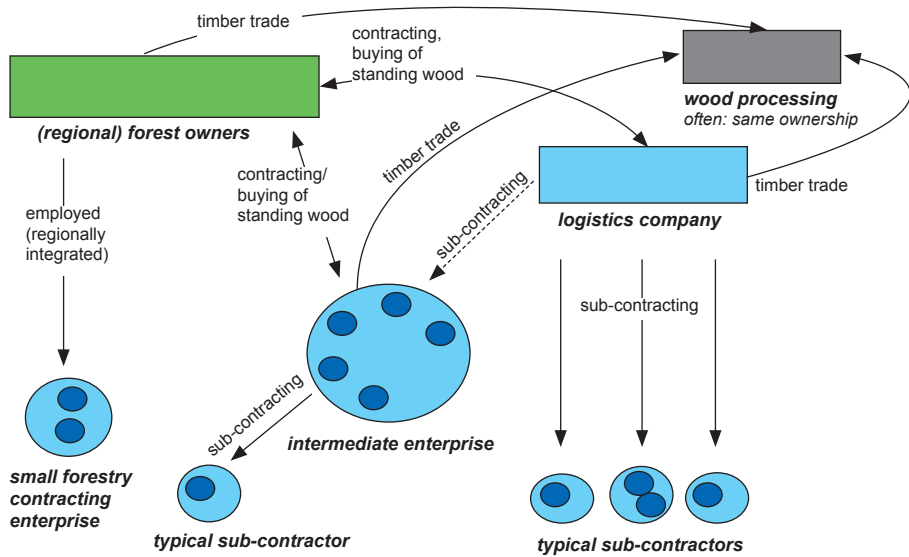


Figure 1. Forestry contractors and their role in the forest wood chain (Westermayer 2005).

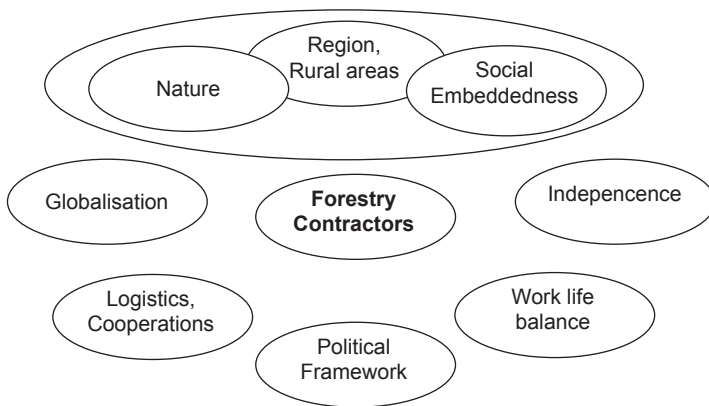


Figure 2. Causing factors for increasing demands (Westermayer 2004).

Forestry contractors are striving to react to the structural changes in their business environment which result from structural change in forestry and rural economies as a whole. Although the conditions in the sector vary much between countries, there may be common solutions to solve mutual problems, and at least there is need for an exchange of experiences between countries. A comparison between countries in different European regions shall provide useful information for finding new ways to profitable businesses. A comparative study of forestry contracting presented in this paper was made based on statistical data, literature studies, and national surveys in four countries: Finland, Germany, Poland and Romania. They all have significant forest resources and forest based industries. The major differences of course are that Finland and Germany are old EU members with developed market economies, a longer tradition of contracting in forest operations, and established forest machine enterprises. Poland and Romania changed their economic system rather recently; Poland is a new EU member and Romania will join possibly next year. The business sector and enterprises in forestry contracting are at a rather early stage of development.

The objective of this paper is to explore key challenges for forestry contractors and existing barriers for their business development and to identify potentials for development. Comparing the situation in four European countries, which represent different regions as well as different stages of development in harvesting, skidding and forwarding operations, offer possibility to draw rather general conclusions and recommendations for research and practice.

2. NATURAL AND ECONOMIC FRAME CONDITIONS

2.1. Small forest sites predominate

Natural and economic conditions influence the daily work of forestry contractors in many ways. Working procedures and business performance need to be adapted to various factors, and consequently strategies all vary between countries but also within countries. Therefore, there is a need to describe some of the predominant frame conditions affecting productivity and cost of harvesting and terrain transport. Productivity and cost depend of course on working method and machinery, but also on tree species, tree size and amount of timber to be harvested on one site or area unit. Steep slopes, poor bearing capacity of soil and sparse density of road network increase difficulties for operations and thus costs.

The forest area (22 million ha) and its share of the total land area (70 %) are largest in Finland (Table 1). The harsh northern climate and coarse soils restrict the possibilities to cultivate soils. In the other countries of our study, the forest area is about 10 million ha and forests cover about one third of the land areas, mainly in terrain and soil conditions which were less suitable for farming. Finland is rather level, but one fifth of the area is peat lands, which can be harvested only when the ground is frozen. In Germany forests often locate on areas difficult to reach and work, like mountains, where special machinery for terrain transport and/or more dense forest road network is needed.

Majority of Polish forests, 86.9 % (Leśné 2004a), is located on lowlands. Mainly on areas which in the past were not attractive for agriculture due to poor or wet soils. In Romania 90 % of growing stock volume is on mountains or hills, where harvesting can be done only by skidders or cableways. Although the forest road network is increasing there; the actual density on road network is now 6.7 metres per hectare. The target is 12 m/ha by 2010. The mountain and hill conditions restrict the harvesting time to late autumn, winter and early spring. Harvesting possibilities depend very often on frozen soil. Small work sites and poor bearing capacity of roads restrict the size of forest machines and trucks.

Table 1. Properties of forests and removals (FAO 2000, Leśné 2004a).

| | Finland | Germany | Poland | Romania |
|--|---------|---------|--------|---------|
| Share of forests in total land area, % | 72.0 | 30.7 | 28.7 | 28.0 |
| Growing stock volume, mill. m ³ over bark | 1 867 | 2 820 | 1 825 | 1 195 |
| Density of forest on wood supply forests, m ³ /ha | 90 | 278 | 213 | 213 |
| Round wood removals, mill. m ³ /a over bark | 53.8 | 51.1 | 28.8 | 14.0 |
| Share of conifers in round wood removals, % | 87.6 | 79.4 | 74.2 | 50.4 |

In Germany the growing stock is almost 3 billion m³ and the average density almost 300 m³ per hectare (Table 1). These values are one third higher than in other countries, and in Finland the density is even only one third compared to Germany. The better growing conditions in Central Europe compared to Northern Europe can clearly be seen in the forestry production figures in Table 1. This can partly be seen also in the higher share of broad leaved trees in the harvested volume in Central Europe. In

Romania the removals divide into half broad leaved trees and half conifers. In Finland only 15 % of removals are hardwoods. Conifers can be much easier processed by harvester, because their branch angle is bigger and they usually have only one stem.

State is an important forest owner in all compared countries (Table 2), especially in Poland and Romania, where the shift to free market economy started fifteen years ago. Other public owners like communities, cities and parishes have importance in Germany and Romania. Forest industry companies have notable forest assets only in Finland. The forest area owned by private non industrial forest owners is about half of the total forest area in Finland and Germany. Because of the previous economic system, their share of forest in Poland and Romania is notably smaller. Private forests are today an important element in land use in Poland, but due to substantial fragmentation, stand characteristics and forest management practices their economical importance is rather low. Only 5 % of harvested wood comes from those forests, mainly for home use.

Table 2. Structure of forest ownership and number of private non industrial forest owners (FAO 2000, Lešne 2004a, Peltola 2005).

| Forest ownership | Finland | Germany | Poland | Romania |
|---------------------------------|---------|-----------|-----------|---------|
| Share of state forest, % | 34 | 34 | 82 | 66 |
| Share of other public forest, % | 5 | 20 | 1 | 23 |
| Share of company forest, % | 8 | - | - | - |
| Share of private forest, % | 53 | 46 | 17 | 11 |
| Total, % | 100 | 100 | 100 | 100 |
| Number of private forest owners | 300 000 | 1 300 000 | 1 000 000 | 700 000 |

When the number of forest owners is considered, one has to pay regard to respective statistical practice, from which size on a forest property is counted as a forest entity. The average size of Finnish private forest owners holding is about 35 hectares, when only properties larger than 4 hectares are taken into account. The average private forest entity in Poland is much below 2 ha and usually almost all forestry work is performed by the owner. 85 % of private Polish forest owners are farmers. It is estimated that more than 70 % of private forest owners in Romania have properties smaller than 0.3 hectare. Therefore forest owners usually do the harvesting by themselves.

However, it is obvious that these overall rather small parcels lead to small harvesting sites. The average size of a harvesting site is 2 to 4 hectares in Finland (Mäkinen et al. 1997). The average volume of a wood transaction is 350 - 500 m³. The harvesting conditions in state and industry forest are usually better than in private forests, because the size of the cutting area is bigger. The average removed volume in state and industry cuttings is 1 000 - 1 300 m³ in Finland. The bigger the cutting site, the less machine transports between work sites is needed. But for example in Finland the wood buying industry still has to make more 140 000 sales transactions per year to aggregate the domestic 54 million cubic metres round wood (Mäkinen et al. 1997). In Germany there are also big private forest owners who could use the advantages of larger work sites.

On the other hand in Poland there are small work sites also in state forests. In Poland it results not only from limiting area of clear cuts in State Forests (up to 4 ha) but also from substantial fragmentation of forest area, dictated by postglacial mosaic distribution of soils and the traditional use of fertile lands for agriculture. In Romania the average logging area in state forest is 10 - 15 hectares, and the average volume removed on one work site is 1 000 - 1 500 m³. There the private forest owners' average harvesting volume is only 10 - 100 m³ per work site.

This overview indicates, that even in countries, where the scale of forest ownership would allow concentration of harvesting operations towards a more economic scale, there is a huge potential for increasing productivity and thus profitability by improved planning on the one hand, and by improved logistics of timber procurement on the other hand.

2.2. Importance of forest utilisation for national economies

The percentage of the increment which is harvested in production forests is 82 % in Finland, 54 % in Germany and Romania and 75 % in Poland (Removals, see Table 1) (FAO 2000). Low utilisation degrees show that there is a huge potential to increase the harvested volume in all countries.

Forestry and forest based industry account for 6 % of gross national product (GDP) in Finland (Peltola 2005). In Germany this value is 3 %, in Poland 2 % and in Romania 3 % (INS 2005). Forests and their utilisation have traditionally been a very important source of income especially in Finland; 50 years ago forestry and forest based industries contributed to more than on third of the Finnish GDP, and before the

rise of the electronics industries the share of forest products in Finnish export income was more than half. In the other countries forestry and forest industry was mainly serving local markets, although Germany has also been an important sawn wood and wood products exporter. These traditions may have affected on the efficiency of wood markets.

As can be seen, the structure and volume of wood utilising industries depend on wood resources and traditions. In Germany, Poland and Romania forest industry has mainly served domestic consumption, as in Finland mostly export. Finland produces paper and sawn wood, Germany is strong in paper, sawn wood and wood boards, Poland in wood boards, sawn wood and paper and Romania in sawn wood and wood boards (UNECE 2004).

2.3. Long trees with chain saws, short logs with harvesters

Forest owners are in charge of planning harvesting operations in Germany, Poland, Romania and in Finland in state and some private forests, whereas industry is until today only considerably involved in harvesting planning in Finland. Felled trees are divided into a log part and pulp wood bolts, which are scaled and sold at the forest roadside or at the mill gate. Buyers of tree-length timber grade the logs at the mill yard according to the customers' orders. In short wood methods the stems are cut into length already in the harvesting process. This is the dominating method in Finland and its share is little by little also growing in other countries (Table 3). In Finland wood is mostly sold at the stump so that the buyer can optimise the grading of stems in wood assortments over large areas to optimise the value of utilisation (Mäkinen et al. 1997). In this case the buyer organises the harvesting. The scaling is carried out by harvester or at the mill gate.

Table 3. Estimates of harvesting methods (Peltola 2005 and local estimates).

| Harvesting method | Finland | Germany | Poland | Romania |
|-----------------------------------|---------|---------|--------|---------|
| Share of cut-to-length -method, % | 100 | 50 | 30 | 15 |
| Share of mechanical harvesting, % | 90 | 50 | 1 | 0 |

There are 700 timber utilising companies in Finland, 3 200 in Germany (Mantau 2003), 3 000 - 4 000 in Poland (Szostak et al. 2004) and 2 400 in Romania (local estimate). In all countries the number of companies is dominated by small sawmills. The

timber buying industry is highest concentrated in Finland; where three multinational companies buy about 70 % of primary domestic round wood and contract harvesting services (Mäkinen et al. 1997). State forest, saw mill companies and some forest owners are the other customers of forest machine contractors. In Finland each harvesting enterprise negotiates mostly one years harvesting agreement with these customers. Other customers than those three big companies and state forest often can not offer long term (e.g. one year) harvesting contracts.

In Germany, Poland and Romania the market structure is different to Finland. In Germany and Poland the predominate sales system is still, that forest owners sell round wood to their customers. Forestry contractors' customers here are mainly forest owners. But with ongoing concentration processes of the wood processing industries e.g. in Germany larger amounts of round wood are needed. To optimise logistics in wood procurement, representatives of wood industries are interested in having contacts to only few key persons, who are able to provide larger amounts of timber. In Romania harvesting sites are often put on auction and contractors buy timber on the stump, and sell the round wood to industries. But concentration of forest industry is taking place even there. According to EU regulations public forest owners have to tender larger service contracts.

Mechanisation of harvesting is among the four countries most extensive in Finland, where site and stand conditions favour it (Table 3). The mechanisation of German harvesting started notably from the large storm damage 15 years ago. Mechanisation increases the work productivity, also work safety, with the price of increased use of capital and reduced labour demand. In Poland and Romania, where labour costs are still very low and where a huge capacity of labour is available the mechanisation degree of harvesting is very small. The number of purpose-built forest machines in Poland is slowly but surely increasing with the pace of 10 - 15 machines a year. The majority bought is still second-hand machines. Driving forces for purchase are mainly low compensation rates for wood harvest and problems with finding skilful operators. Main reasons of low mechanisation in Romania are difficult slope conditions and difficulties in collecting or loaning capital.

3. GROWTH VERSUS SECURITY?

In Finland and Germany entrepreneurship in forestry has a rather long history, at least compared to Poland and Romania. Contractors are organised in associations

and the actual work is largely mechanised (Table 3 and 4). In Poland and Romania the enterprises started to form some years ago when state forest offices started to outsource harvesting operations. The abundance of workers and lack of capital has restricted harvesting on a motor manual level. The organising of entrepreneurs in associations is still developing. The number of entrepreneurs in Finland, now 1 300 (Table 4), has started to decrease. Until the last ten years the numbers grew because the mechanisation degree increased. Now, the customer companies promote larger enterprises and the number of entrepreneurs has started to decrease.

In Germany the number of entrepreneurs has grown because of rapid outsourcing of harvesting in state forest and large private forest ownership. Ten year ago there were 10 000 forest harvesting entrepreneurs in Poland, now 7 500 (Table 4). The economic situation and State Forest policy contributes continuously to a decrease of the number of enterprises in harvesting. After the system changed in Romania, the 40 wood utilising companies (1990) have divided in 2 400 companies today. They still buy wood mostly from auctions arranged by the National Forest Administration. 1 800 small enterprises harvest timber for utilising companies. The industry is willing to buy the wood directly from harvesting companies as wood assortments, but the change still needs time. It is expected, that the number of harvesting companies will grow, but the number of timber utilising companies will decrease. In all countries the harvesting activities have been arranged more in business like way, even if far too many enterprises are still not professionally managed.

Table 4. Number of forest harvesting entrepreneurs and harvesting workers (Koneyrittäjät 2006, Westermayer and Brogt 2004, Brogt and Westermayer 2005, Kocel 2003, Peltola 2005).

| Enterprises | Finland | Germany | Poland | Romania |
|--|---------|---------|--------|---------|
| Number of harvesting entrepreneurs | 1 300 | 7 000 | 7 500 | 1 800 |
| Number of harvesting workers (besides the entrepreneur) | 4 000 | 20 000 | 35 000 | 30 000 |

An average enterprise in Finland, Germany and Poland consists of 3 - 5 workers. In Romania there are in average about 16 workers in one enterprise. In Finland and Germany there are each about 1 500 harvesters and 2 000 forwarders (Koneyrittäjät 2006, Nick and Forbrig 2002). Beside these there are in Germany seasonally 6 000 skidders and farm tractors and 1 000 horses working in forest operations. The

number of forwarders in Poland is 80, and the number is increasing slowly, because old type saw mills still prefer tree length timber. Forestry contractors rather buy modern farm tractors than purpose-built skidders, as former are cheaper and can be used for other works, like in planting or in crushing logging residues. One forwarder is working in Romania, where the majority of terrain transport is carried out by farm tractors, skidders and horses. Even when an average Romanian harvesting enterprise employs 16 workers, this still means that harvesting enterprises in general are small rural businesses in all countries. And of course the harvesting enterprises are very small compared to most of their customers.

In all countries most of the enterprises are still single-owner companies, but more official business forms are increasing with the growing size and increased professionalism of enterprises. Some first examples can be found in Germany, where single contractors are working together under a kind of umbrella organisation which takes over all the logistics and administration tasks.

In most cases a harvesting enterprise offers only harvesting operations, and is contracted by forest owners or by forest industry companies. In Germany there are some bigger harvesting companies, which buy wood from forest owners and sell wood assortments to mill yards of different utilising companies. There is a possibility to increase profitability by grading the timber assortments to optimise the value, but there is also risk of getting non marketable wood. Also the need of capital is high compared to the profit possibilities. Some harvesting contractors in Poland have started new activities like sawmilling or even non-forestry related businesses.

Other trends besides the growth of enterprise size are an increasing degree of mechanisation. The growing international wood utilising companies require faster delivery schedules, cleaner raw material and wood assortment dimensions according to order. To meet these requirements and the burden of rising salaries, entrepreneurs increase the utilisation ratio of harvesters and forwarders. In Finland and Germany most of the conditions, where mechanised harvesting is possible, have already been mechanised. At the pace of mechanisation the number of workers is decreasing, but the quality and education requirements increase. There is need to arrange systems to recruit and train new operators and service staff.

In Polish conditions the mechanisation level is influenced by technological level of wood processing industry, mainly sawmilling. There is some concentration process in this branch, so one can expect a higher demand for short logs and suitable forest

machinery in the near future. In Poland entrepreneurs can complete their education at the Educational Centre for Forest Entrepreneurs (2006). State Forests are recently organizing a training centre for forest machine operators. In Romania harvesting mechanisation is proceeding very slowly, because of the geographical conditions. Increased forest road density and quality could open way for heavier transports and better productivity.

4. MUTUAL PROBLEMS IN ALL COUNTRIES

Looking at the countries Finland, Germany, Poland and Romania we find that forestry contractors are faced with various problems. One task of the authors was to identify similarities and differences in forestry contractors' problems in the different countries, i.e. in European regions of different economical history. As stated before, the economic, ecologic and social situation is different in the countries most likely ranging from most developed situation in Finland to the developing situations in Poland and Romania.

In general, the market situation of forestry contractors is characterized by the strong market power of customers, especially in Finland, and also of big forest owners like in Germany and Poland. Their strong market power result in hard economic framework conditions for forestry contractors, as they often totally depend on the need for round wood of wood processing industries. But there are also other problems than economic ones that have strong impact on forestry contractors' work and business performance (Table 5).

Many of the problems and challenges shown in Table 5 are closely connected to each other and consequences derive often from interactions of various factors. The economic problem is predominant in scientific discussion due to the reason, that other problems are hard to identify and mainly hard to measure. However, the economic situation is only the tip of the iceberg while other problems lie under the surface.

Economic problems of forestry contractors seem to be mutual in all European countries. In a developing business environment like in Poland and Romania there is hard competition between contractors starting their business from scratch. In more developed business environments like in Finland and Germany, customers start to enter into partnership contracts with entrepreneurs; with the result that customers know the cost structure of the enterprise. This approach is starting to appear also in Poland resulting in promoting bigger more powerful enterprises. In all cases the entrepreneur has to be content with very low profit margins.

Table 5. Forestry contractors' problems in Finland, Germany, Poland and Romania.

| Type of problem | Characteristics |
|---|---|
| Economic problems | Prices are stagnating/constant. Costs get higher and higher. Low credit rating. High interest rate in some countries (e.g. Poland). No financial buffer. |
| Ergonomic problems | Working on harvesters, forwarders or skidders for very long hours means back pains, problems in the neck/shoulder area and psychological problems due to "working alone". |
| Technical problems/ variations | No money, no new machines leads again to ergonomic problems and if no new contracts are made due to old machinery also economic problems. |
| Qualification gap and lack of skills | Forestry contractors are in most cases well trained mechanics or even foresters; but there is a lack management and business skills. The German and Polish situation is that forestry contractors were and still are very close connected to state forest officers. That means that personal relationship secures that new contracts are made. But contractors do not always properly calculate costs, because "it was always like that". |
| Changing customers' demands | Wood processing industries demand larger amounts of wood just-in-time. Logistics become more and more important. |
| Society's demands | Societies' demands for environmental friendly and ecologically sound forest utilisation is increasing; public governance has raised awareness, and forestry contractors have more and more restrictions and regulations, which are e.g. laid down in forest certification schemes; even if the demands and costs rise, this is not reflected in higher prices for forest operations. |

The tendering system used by many customers also leads to very high market pressure. The same follows from the imbalanced negotiations between one big customer and many small harvesting enterprises. Low degree of organisation between competing entrepreneurs leads easily to a situation, where the lowest bidding enterprise is losing profitability during the fulfilment of the contract. At the same time other more profitable enterprises may disappear because they have no work. The poor economic situation can be seen in statistics in Finland, where about 20 % of all harvesting contractors were making losses during 1999-2002 (Kärhä 2004). The net result of median enterprise was 6 per cent in 2002. The debt/turnover ratio of median enterprise was 60 %, which show high dependency of creditors. These figures also explain the low credit rating and consequently the problem to get loans for investments. Financial buffers hardly exist and time of non-use of machines is affordable only for very short time periods. Here the situation may differ between countries like Finland or Germany, where high mechanized harvesting systems are used and Poland or Romania, where a high percentage of harvesting operations is done in motor manual systems.

Operating costs have substantially increased over the last few years, fuel in the front. That affects directly the profitability of the business, if there is no possibility to readjust the price during the term of bidding or duration of the contract. Proper agreements include one or two checks of cost indices during the contracted period. Poor economic situations complicate the replacement of old machinery and collecting capital for the development of an enterprise. Both harvesters and forwarders are short series purpose build special machines. Capital cost make up for over one third of the enterprises' total costs. The economic situation of harvesting companies decline very fast if there is no work for machines, even during the seasonal spring, summer and autumn breaks. National over capacity or decrease of the work volume drops the reselling price of machines to the bottom.

International competition becomes harder all the time; Finland imports almost 20 % of its total round wood utilisation, Germany 5 %, Poland and Romania less. There is also competition where new production units of forest industry are located. Countries with low labour cost have big advantage. There is also temptation to use moonlight labour to reduce the personnel costs. Harvesting enterprises working in countries with high cost and top level nature protection requirements have to be very efficient to compete with enterprises in countries with lower costs and less requirements. However, it is likely that internationally acting forest industry companies will spread their best practices all over their operation areas.

Besides the economic problems, ergonomic problems occur in harvesting, skidding and forwarding. It is well documented that motor manual work is one of the most dangerous and harmful to health. The ongoing shift from motor manual to high mechanised harvesting systems alter also ergonomic and health problems. The situation in Finland differs from that in Poland or Romania concerning the harvesting systems and consequently the ergonomic problems. As we assume that the future lies in high mechanized harvesting systems also in East-Central European countries, and the fact that health problems caused by motor manual work are well known, we will focus only on ergonomic problems in high mechanized harvesting systems.

There is a close link to economic problems that lead to very long working hours in order to earn enough money to continue with the business as a forestry contractor. The EU financed project "Ergoefficient mechanised logging operations – ERGOWOOD" (ErgoWood 2006) shows that working on harvesters, forwarders or skidders for very long hours results in back pains, problems in the neck/shoulder

area and psychological problems due to working alone. The result is reduced work efficiency and in the worst case an economic problem if machine operators become unable to work.

Ergonomic problems come along with technical problems. From a technical point of view, there are great improvements in machinery. There are fine solutions in e.g. seats, spot lights, entrance to the cab, noise and vibration absorbers or air condition. However, in practical work the equipment may vary considerably in quality and age. The lack of money to invest in new machines leads to health problems, as described above.

One of the most neglected problems is the qualification and lack of business skills. Forestry contractors are in most cases well trained mechanics or even formally qualified forest workers. But generally there is a lack of skills for management of a business (Morat 2005). In Germany forestry contractors were and still are very closely related to state forest officers. That means that personal contact secures new contracts. Contractors do not always calculate properly their cost, because "it was always like that". The situation in Finland is different as most forestry contractors have some forest or mechanics education. But the business skills are still underdeveloped to compete on the hard market. In Poland only 10 % of harvesting enterprise owners have a forestry background (Kocel 2003), but many of their employees are former State Forest workers. There is little knowledge about qualification of Romanian contractors, but it can be assumed that formal education and training is missing in most cases.

Besides the problems mentioned above there is one problem that should be mentioned even it is to some extent already covered. Wood markets are liable to rapid changes on the side of wood processing industries, characterized by concentration processes and internationalisation. The result is that wood processing industries demand larger amounts of wood than in the past, as processing capacities are rising. Biggest forest harvesting enterprises in Finland and Germany own tens of machines and hire tens of operators, but in most cases companies have in average only 3 - 10 employees. Organising wood harvesting on entrepreneurial base is just in the beginning in Eastern Europe. So enterprises are small and the business is unknown to financiers. Consequently, there are problems to collect capital for investments and expansion.

Based on these comparative observations we can assume that most problems are mutual when looking at comparable harvestings systems, i.e. high mechanized harvesting systems. Even if they are not yet as common in Poland or Romania as in Finland or Germany, there is evidence that problems are the same. Wood industry companies are operating without frontiers and demand round wood in large quantities. Differences occur in land tenure or size of harvesting sites, all influencing the performance of forestry contractors in the whole Europe. But economic pressure, ergonomic problems, technical standards and use of machinery or lack of qualification or business skills are mutual with the consequence of unattractiveness of the job especially to young people (Blombäck et al. 2003). Evidence can clearly be seen in Poland, where the unemployment rate in rural areas is extremely high, but where working as forestry contractor is not an attractive employment option for many people.

5. ENTERPRISES' MEANS FOR DEVELOPMENT

Growth of a harvesting enterprise offers some advantages. Big enterprise can negotiate more economic prices for machines, fuel, parts and services. When an enterprise owns many machines it is possible to divide the machine park in special machines, like thinning harvesters, tracked machines for slopes etc. According to Imponen (2003) in Finnish conditions the cost for harvesting 2 million cubic metres per year is five per cent cheaper when harvested with special machines compared to harvesting with same medium size machines. Big contractors have also more negotiating power with customers, because using many small contractors very often increases customers' organisational cost.

There are many ways to grow the contractors' business and thus the negotiating power with customers. One is to become a big company; one contractor starts to buy other contractors or their businesses. Another way is to create a service company, which handles the negotiations with customers, does the planning and divides the resources. Subcontractors working for this "general contractor" can then concentrate on their core business: harvesting. A third way is to develop as one "area" harvesting enterprise, which does part of the job itself, but hires services from other contractors to fulfil the contracts. There is place and need to generate new models for arranging the co-operation between contractors.

The owners and directors of harvesting enterprises have to gather more business, leadership and public relations expertise to cope with increasing external requirements and enlargement of their business. In big enterprises the directors do not have time anymore to operate machines themselves, but even a small entrepreneur needs new business skills. The working conditions have to be shaped so that best workers are interested to come to work just in this enterprise. Individual solutions work often better than using general terms. Contractors associations can lobby for official qualification systems for operators or improve the qualification level, both on national and European level.

Are there new business opportunities for instance in offering forest planning and silviculture services? It may be an important marketing factor, that a forest owner can contract all forestry tasks from logging to planting with one enterprise. This enterprise can then produce all services by themselves or subcontract parts of the services to other companies. Maybe networking with local small and medium size wood industry and/or forest owners offers continuous work. Finding new possibilities and marketing old strengths is important. There is not necessarily the need to become a big player; there is some evidence that small contractors can try to find new market niches, where the small size of enterprise may even be beneficial.

Many problems arise from the hard competition between harvesting enterprises. One way to keep the business profitable is to develop entrepreneurs own associations. These can co-ordinated watch entrepreneurs benefits in society, train member's skills and develop the whole business by making or ordering research and development. Through the pressure on markets and society, the enterprises association could affect on the tendering procedures and direct agreements, so that besides price, work quality, environment and reliability are taken in consideration as criteria to choose the best contractor. That could foster more continuous development of customer-contractor partnership, where both parties benefit. According to Porter's competition model a company can compete with others by price or by special products or services. In negotiation with big industrial customers price competition is hard, but it is also fairly of the hard to find special services, which then again could be charged with higher price.

Table 6. Enterprises' means for development.

| Means for development | Characteristics / Advantages |
|---|---|
| Business growth | Better position for negotiation: <ul style="list-style-type: none"> • take over other businesses • establish service company, • co-operation with other contractors as sub contractor. |
| Improvement of "soft skills" | Business skills. Leadership skills. Public relation expertise. |
| Improve working conditions | To attract qualified staff, working conditions must be improved through individual solution adapted to special business profile. Education and further education must be enhanced. |
| Services, competition and market position | Enlargement of services may offer new opportunities, market niches can be discovered and provide new sources of income. Customers demand more and more for specialized enterprises providing a wide range of services. |
| Representation of interests | Forestry contractors associations can support enterprises and act as mediator between interest groups. |

One important measure to cope with the multiple problems is to join forces and to establish a mutual representation of contractors' interests in associations. Rather well established associations represent harvesting enterprises in Finland (Koneyrittäjät 2006) and in Germany (Deutscher Forstunternehmer Verband 2006). The Polish Association of Forest Entrepreneurs (2006) groups 230 enterprises and several local and regional associations were recently funded. The Romanian Association of Foresters (ASFOR 2006), founded 1994, represents harvesting companies, although the name is foresters association. And on European level the European Network of Forest Entrepreneurs (ENFE 2006) is established as an organisation for lobbying and development. Through information exchange, research and development initiatives ENFE fosters improvements for entrepreneurs and employees. The table 6 shows means for development in a short summary.

6. BARRIERS TO ENTREPRENEURSHIP

Entrepreneurship can be described as action to run a business. But the actual situation is far too often in a way that the entrepreneur is actually working for customer under customer's guidance and to customer's price. This was actually the case when harvesting businesses start. The "profit" of the "business" was often the "right" to work longer than others so that the "entrepreneur" could pay the machine. Real entrepreneurship includes the risk for the loosing the invested capital, but also the

right to choose the ways what and how to operate, and also the demand to look all the time for new fields of activities. When starting the harvesting enterprise, the entrepreneur should check and calculate whether there is really the right time and place for running a profitable business and that the customers allow the entrepreneur to take independent decisions.

The society and especially the EU is interested to promote free competition, based on the optimistic idea that competition brings forth the most economical and effective solutions to solve different tasks. Each nation and even smaller areas have own rules, traditions and habits. They may prevent or hinder competition. The society is looking and trying to remove the barriers to entrepreneurship even in harvesting business.

The barriers to entrepreneurship can be barriers to enter (or go out of) the business, barriers to run the business or even barriers in entrepreneurial thinking. Outstanding examples for barriers are the lack of capital to buy machines, lack of customer relationships or lack of enterprises' recognition. Secondary is for example lack of mechanical or biological skills or lack of certificates. Thirdly there are traditional and outdated ways to operate, or the thinking that the customers know better how to work than entrepreneur.

To start a mechanised harvesting business one has to develop diverse know-how, purchase machines, hire skilful operators and build up a work organisation scheme. The need for capital and know-how is big compared to prospective profits. The capital value of a company is small, so if one will back off from business, he gets only the second hand value of the machines. Therefore, the poor capital value is even a barrier to go out of the business. Usually one can not sell contracts forward, because the customer may demand experience, reliability, even certificates from new entrepreneurs. Entrepreneurs who are not making profit and those who are old can have difficulties to end the business, because they would loose all their investments.

Customers' negotiating power is often overwhelming compared to entrepreneurs'. This may create many kinds of barriers to come or stay in business. The common tendering systems to choose harvesting contractors contain no special barriers to come into business. Keeping up in competition may restrict enterprise's resources to develop the business further, due to a lack of profit.

In the mutual agreement system which is common in Finland, customers can set compulsory requirements and thus affect the operating possibilities of the

entrepreneur. In Finland the three biggest industry customers have each their own data processing and transfer systems, which have to be installed in machines. Customers can require certain types of machines or scaling systems. Thus working for another one of these three is impossible with the same machine. Earlier, customers preferred enterprises with one harvester-forwarder-system, but today larger enterprises are favoured. Customers sometimes arrange courses for enterprises and their operators, for instance on quality management systems and environmental protection. Lack of this knowledge may be a barrier to get an agreement, but on the other hand the courses can also be useful in servicing other customers.

Polish experiences differ as the State Forests are the main and practically the only one customer. So it is obvious that majority of barriers to entrepreneurship have their origin in relations between forestry contractors and forest officers. For many years, practically from the beginning of privatisation processes in Polish forestry, State Forests favoured small enterprises, benefiting from a dominating position. Now this attitude is starting to change. More and more forest district managers perceive them as business partners. It is clearly shown in that public procurement specifications prefer better equipped and knowledgeable enterprises.

The harvesting market in Romania is open. Problems to stay in business are bigger than to enter the market. Besides the low profits, poor credit systems do not encourage to invest in new technology. The labour force is old and poorly trained. Many problems lie in the procedure, where the contractors buy the wood and sell wood assortments to mills. The price variation in market changes may plunder the profit. There is also risk to buy trees, which have hidden defects, which drop the value of wood assortments.

Inside the EU many tax and labour legislation regulations are or will be harmonised, so it should be easy to work in another country as an entrepreneur. The storm damages in Germany and in France in 1990s and recently in Sweden 2005 have shown the need to get fast extra capacity for harvesting over the borderlines. There are however many difficulties, we may call them barriers, for working in another country. The forestry itself is quite a traditional business with old fashioned trade practises, contents of agreement, scaling and grading systems and other traditions. When the round wood import and export volumes grow, it would be profitable to harmonise at least the most common scaling systems.

Table 7. Categories of barriers to entrepreneurship.

| Barriers | Characteristic |
|---------------------|--|
| Structural barriers | Lack of capital to buy machines. Lack of customer relationships. Low profitability. Lack of enterprises' recognition. Rapid changes of market conditions. |
| Individual barriers | Lack of mechanical or biological skills. Lack of business skills. Traditional and outdated ways to operate or the thinking that the customers' know better on how to work than entrepreneur. |
| Formal regulations | Lack of certificates. Hard to get credits. Laws and regulations in the different countries. |

7. PROBLEMS FOR ENTERPRISE DEVELOPMENT

Pressure on prices for forest operations driven by hard and more and more global competition on round wood markets keep the profit of harvesting businesses low. Hard competition between domestic harvesting enterprises and to some extent to contractors from abroad sharpens the market situation. Customers have the overriding power either through the tender system or through the imbalance in size in direct negotiations. Customers may even raise requirements, which directly affect the operational preconditions of harvesting enterprises. Not all markets are saturated with big customers. It may be even a problem to collect so many customers that the enterprise's full capacity will be filled. There are also many entrepreneurs, who are satisfied with their small size business and who are not interested to grow their business.

Earlier, the state forests and in Finland also forest industry companies, developed the wood procurement business. Now they outsource the harvesting and transport, so the risk is now on the harvesting and transport enterprises. Earlier machine manufacturers developed the forwarders and harvesters, because more productive machines could get better markets. Machine evolution is now in a mature phase and the production has concentrated in few international companies. Lengthening the production series and utilisation of parts of other products lower the price of machines, but may not develop chances for new productivity level machines.

The steps from motor manual cutting to harvesters and/or from horse and farm tractor to forwarder are capital intensive. It is difficult to get the funding for several

years investments, if the entrepreneur can not show guaranteed work for at least the first year. He may lose already the next year bidding. In the countries with tradition of manual forest work it may be very difficult to collect capital for big investments in rural areas. This may lead to strong dependencies from banks. Introducing multi-year contracts is seen by many forestry contractors in Poland as a way to increase the mechanisation level of wood harvest. Mechanising is possible only with advanced training systems for operators and service staff.

In the outsourcing enthusiasm the development of wood procurement is left to the weakest part. The harvesting enterprises are small so that the owner/directors have usually problems to deal with operational, business and strategic problems and even operate or maintain one machine. Therefore it is easy to understand that there are very limited resources to develop the business and operations. Even the owner/director's education may not be adequate for strategic planning.

8. FACTORS AFFECTING THE COMPETITIVENESS OF FOREST WOOD CHAIN

Harvesting is an important and crucially needed part in wood utilisation chains, but its share is minimal in the price of most wood products. Harvesting cost is only 1.6 % of the total cost of Finnish pulp and paper industry and 3.0 % of the total cost of mechanical wooden products industry (Lähtinen 2005). The share of wood price (paid to forest owner) is 4.2 % of the total cost of pulp and paper industry, but already 23.2 % of the total cost of wooden products industry. The importance of the harvesting cost depends very much on the value of the end product. At the biggest it may be in harvesting energy wood from first thinnings. The wood price paid to forest owners in Finland may be 2 - 3 €/m³, harvesting and terrain transport 20 €/m³, chipping 5 €/m³ and road transport to a power plant 5 €/m³.

The general appreciation of wood as a renewable material for countless products and purposes must have to be raised compared to other not-renewable raw materials. Then the paying capacity of the whole branch would be better. The main criterion for harvesting has been to produce general wood assortments at low prices at the road side. Even now the division of stem into wood assortments can be made by a harvester according to the value based optimisation algorithm. But there are no restrictions to put more effort in producing different products with special measurement and quality requirements. The price will increase little, but it may become possible to gain much more extra value for the end product or service. This is a question of negotiations between forest harvesting enterprise and the buyer of the services. There should also

be interest to develop the wood industry and wood harvesting to promote the local rural economy.

9. RESEARCH DEMANDS IN THE WOOD SUPPLY CHAIN

There is lot of knowledge about harvesting enterprises' actual situation. The main challenges are the questions rising from the customers' policy to outsource the harvesting work and even it's planning to harvesting enterprises. In Finland the challenge shows as a question how to increase the size of contractors and at the same time increase the profitability of businesses. In Germany a question is how the harvesting enterprises can bit on the customer's tenders and maintain the profitability of work. In Poland and Romania the question may be how to create profitable harvesting enterprises, which can answer the increasing productivity and quality requirements of growing customers. The problem is that we do not know answers to the questions how to improve the performance of the harvesting enterprises. The basic question is the same in all countries involved in this study, but the point of view varies between them. So there is an important task for research, both international and domestic.

Local harvesting optimisation may not give optimal solution for the whole chain. The wood industry is outsourcing many wood procurement tasks to small enterprises, which for their part have very limited or no resources to develop their operations. There is place for official or participant paid research. Challenging differences in different countries require flexible models.

Business and economical studies are needed to find various possibilities for development. What are the critical bottle necks of today's businesses? There are pressures to increase the size of businesses; what is a critical size for viability? What is the best way to grow; business acquisitions or networking? How to develop new business models for forest operations? Is a partnership model in the supply chain a viable solution? Is specialisation or diversification the more effective way to improve profitability? There is need to generate effective data gathering and analysis tools for the entrepreneurs. Low price is today the most important factor for competitiveness, but other factors like quality of work, reliability and abilities to communicate with forest owners rise to compete with the low prices.

Operational and economical studies could clear the location of harvesting enterprises in the wood supply chain for different products. Are there reasonable horizontal or vertical integration possibilities in the supply chains? Is there enough place and possibilities for harvesting enterprises to make independent business?

What traditions, trade practices and other business actions are unnecessary or even harmful and how could they be altered? Harmonisation of national business and wood harvesting systems would help enterprises to operate in other countries for example in the case of clearing storm damages.

Social and education studies are needed to determine the best suitable operator candidates and to develop effective qualification systems for both junior and adult learners. The practicing and connections with employers are important. How to create a challenging and interesting working environment for operators? Can working in teams and job rotation bring better working ergonomics, both physical and mental, or even better job satisfaction?

The further development of machinery and data processing and transfer systems is also an important task. Even after very big steps in improving machine ergonomics and safety, there still are problems to solve. Operators are still exposed to harmful vibrations and swinging. There are too many decisions to make for the operator. How could the information stream be analysed and automated to help operators? Is it possible to increase the productivity by automating some of the work phases? There is need to develop the general purpose machinery for special conditions, like mountains, poor bearing peat lands, branching hardwoods. Is it possible to share the capital cost of a base machine by using it in different works? Do we need all the sophisticated features of today's forest machines, or could it be possible to build simpler and cheaper machines?

As this comparative study indicates, one of the most crucial needs to cope with the increasing challenges in the forestry contracting sector is entrepreneurial and managerial skills of the contractor running an enterprise. This means, the entrepreneur is the most important target person for knowledge transfer from research to practice in this business. Research and development has to find the appropriate means and channels to reach contractors with knowledge, both technical and economical, that is required for a successful business development. The questions need to be followed up: What is now important for him or her? How do contractors want to develop their business? What are the individual values and expectations that have to be met and fulfilled?

And the crucial question for the whole forestry and wood sector is: How can keen and qualified entrepreneurs be motivated to run a harvesting business in the future?

REFERENCES

- Blombäck, P., Poschen. P. and Lövgren, M., 2003. Employment Trends and Prospects in the European Forest Sector. Geneva Timber and Forest Discussion Papers. ECE/TIM/DP/29. ENECE/FAO.
- Brogt, T. and Kastenholz, E., 2005. State - of - the -art country report Germany. COST E30 Report WG2 SG "Forestry contractors". (<http://www.joensuu.fi/coste30/WG2SG3.htm>)
- Brogt, T. and Westermayer, T., 2005. Bundesweite Hochrechnung: Forstdienstleister überwiegend kleinste motormanuelle Holzernte- und Rückeunternehmen. *Forst&Technik*, 3:10-12.
- Budna, E., Grzybowska, L. and Zytecka-Karolak, M., (eds.). 2005. *Leśnictwo 2005*, Central Statistical Office, Warszawa.
- Ciurea, I. and Borlea, G. F., 2005. Forest Products Market in 2005 and prospects for 2006 in Romania. UNECE Timber Committee, 63rd session September 2005, Romanian Country Market Statement.
- FAO. 2000. Global Forest Resources Assessment 2000. Main Report. FAO Forestry Paper 140. (source: <http://www.fao.org/forestry/site/7949/en>)
- Golos P., 2004. Analiza prywatnych gospodarstw rolno-leśnych i leśnych w Polsce – projekt sieci gospodarstw testowych - etap II [Analysis of private agro-forestry farms in Poland – project of test farms network], Forest Research Institute, Warszawa.
- Imponen, V. and Poikela, A., 2003. Erikoiskoneet haastavat yleiskonelinjan. Summary: Specialized logging machines pose a challenge for medium-sized harvester-forwarder chain. *Metsätehon Katsaus* 11.
- INS. 2005. Romanian Statistical Yearbook 2005. National Institute of Statistics. Romania in figures, 2005, National Institute of Statistics.
- Jodlowski, K., Kocel, J. and Zastocki, D., 2005. State - of - the -art country report Poland. COST E30 Report WG2 SG „Forestry contractors“. (<http://www.joensuu.fi/coste30/WG2SG3.htm>)
- Kocel J., 2003. Sektor usług leśnych – stopień i zakres przemian, instrumenty wspierania oraz rola sektora w łagodzeniu bezrobocia. [Sector of forest services – degree and scope of changes, supporting instruments and role of sector in decreasing of unemployment rate], Forest Research Institute, Warszawa.
- Kärhä, K., 2004. Metsäkoneyritysten kannattavuus 1999-2002. Summary: Profitability of forest machine companies in Finland during the years 1999-2002. *Metsätehon Katsaus* 5.
- Lähtinen, K., 2005. Metsäteollisuuden kustannusrakenne. Metsäsektorin suhdannekatsaus 2005-2006. Metsäntutkimuslaitos, Helsinki. Pp 32-33.
- Mantau, U., 2003. Standorterfassung in der Holzindustrie. *Holz-Zentralblatt* 129(97):1406-1407.
- Mäkinen, P., Rummukainen, A. and Aarnio, J., 1997. Puunhankinnan organisointitavat. *Metsäntutkimuslaitoksen tiedonantoja* 647.
- Morat, J., 2005. Qualifizierungsbedarfsanalyse als Grundlage systematischer Weiterbildung in Forstunternehmen. WALD-Working Paper 12, Freiburg: Institute of Forest Utilization and Work Science.
- National Forest Administration. 2005. Public wood auction records, Romania.
- Nick, L. and Forbrig, A., 2002. Forstmaschinen in Deutschland. *Forst & Technik* 7:20-21.

- Leśne, P. G., 2004a. Lasy Państwowe, Raport o stanie lasów w Polsce 2004. Centrum Informacyjne Lasów Państwowych, Warszawa.
- Leśne, P. G., 2004b. „Lasy Państwowe” Raport roczny 2004, [The State Forests National Forest Holding Annual Report 2004]. Centrum Informacyjne Lasów Państwowych, Warszawa.
- Peltola, A., (ed.). 2005. Finnish Statistical Yearbook of Forestry 2005. Finnish Forest Research Institute.
- Rimmler, T., Rummukainen, A. and Röser, D., 2005. State - of - the -art country report Finland. Cost E30 Report WG2 SG “Forestry contractors”. (<http://www.joensuu.fi/coste30/WG2SG3.htm>)
- Szostak A., Bidzińska G., and Ratajczak E., 2004. Diagnoza zużycia surowca drzewnego w Polsce i prognoza zapotrzebowania do roku 2020. Cz. I Określenie rozmiarów zużycia drewna przez podstawowe branże krajowego przemysłu w latach 1999 – 2003, Institute of Wood Technology, Poznań.
- UNECE. 2005. European Forest Sector Outlook Study (EFSOS). Main Report. Geneva Timber and Forest Study Paper 20. United Nations, Geneva.
- Westermayer, T., 2005. The out-sourcing of work in Germany's forests: Findings and consequences in relation to the transformation of rural social structures and identities. Presentation at the XXI Congress, European Society for Rural Sociology, 22.-27.08.2005, Keszthely, Hungary.
- Westermayer, T., 2004. Werkstattbericht: forstliche Dienstleistungsunternehmen. WALD-Working Paper 8. Freiburg: Institute of Forest Utilization and Work Science.
- Westermayer, T. and Brogt, T., 2005. Zur Zahl forstlicher Dienstleistungsunternehmen. GFH Freiburg. Informationen aus Forschung und Lehre 19:11-12.
- Westermayer, T., Brogt, T. and Oorshot, J., 2004. Forstdienstleister sind in der Mehrzahl Kleinunternehmen. AFZ-Der Wald 23:1247-1249.

INTERNET SOURCES

- Deutscher Forstunternehmer Verband e.V. (<http://www.forstunternehmer.org/>; 2006)
- Educational Centre for Forest Entrepreneurs. (www.lzd-siemianice.home.pl/centrum.html)
- European Network of Forest Entrepreneurs (ENFE). (http://www.enfe.net/index_e.htm; 2006)
- ErgoWood Project Homepage. (<http://www2.spm.slu.se/ergowood/>)
- Koneyrittäjät. (<http://www.koneyrittajat.fi/?id=122>)
- Polish Association of Forest Entrepreneurs. (<http://www.splgoluchow.pl>)
- Romania. National Institute of Statistics. (<http://www.insse.ro/>)
- UNECE. (<http://www.unece.org/trade/timber/mis/fp-stats.htm#Statistics>)

MARKET ENTRY BARRIERS, STRATEGIES AND INNOVATION IN INDUSTRIES OF THE STRUCTURAL WOOD PRODUCTS SUPPLY CHAIN¹

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SUMMARY

Objectives and scope

One of the three working groups of the COST Action E30 was established to address the questions related to the supporting and limiting factors for enterprise development in the wood-processing industry. The major questions pinpointed are the performance of the industry in terms of technological innovation, integration and vertical collaboration along the wood products value chain and barriers to entry for timber frame solutions in building construction markets. An examination of strategic and innovative behaviour deals particularly with the sawmill industry. Incentives and obstacles for innovation and limitations for timber frame solutions to enter construction markets are addressed.

Theoretical background

In search for factors of competitive advantage and innovation the study is tapping the resource and competence based views on competitive advantage. Porter's cluster approach and value chain approach are of relevance, as well. In search for the determinants and patterns of innovation of an industry the concept of sectoral system of innovation is applied.

Results

Chapter 3: Actual and potential demand for structural sawn products in housing construction. The average share of timber frame construction methods in total housing production in Europe is below 5 % with large country-by-country differences. Single-family and two-family duplex houses are the prevalent types of timber frame dwellings. Off-site prefabrication techniques are common in the Nordic countries,

¹ The paper was authored by Rimmler (chapters 1-3, 5, 7-9 and 12), Cooper (chapter 10) and Ollonqvist (chapter 11). Chapters 4 and 6 were authored by Rimmler and co-authored by Cooper. The paper was contributed by Dainis Dauksta (Cefncoch, UK) and Anders Q. Nyrud (Agricultural University of Norway). Dainis Dauksta made language revisions.

the UK and Germany. A doubling of the market share of timber frame in residential building construction in those European countries where the present share is low would provide a net increase in the demand for structural sawn timber by 27 % compared to its level in 2001.

Chapters 4 and 5: Features and the business environment of the wood products industries. The wood products industries in the countries compared are dominated by basic products and considered weakly integrated into further processing towards structural timber products. There is a shortage of sub-product and component suppliers capable to drive customer-focused product development and a limited ability of small firms for reacting to market changes. Small firms do not dispose of marketing competencies. Collaborative supplier networks are required to gain access to markets for value-added structural products.

The product portfolio is dominated by non-complex products. There is no sign indicating revolutionary technological breakthroughs. Nonetheless, there might exist pockets of demand for innovative products. The industry's risk-avoiding behaviour excludes explorative innovation policies. Under the prevailing competitive regime efficient production methods are the main source to uphold short-run profitability. Complementary activities are crucial in fending off competition.

Chapter 6: Strategy, product policy and innovation behaviour of the sawmill industry. A portrayal of the sawmill industry is drawn in terms of business strategy and product policy. Evidence from Finnish sources is generalized in many respects to fit for the sawmill industry in the UK as well. The requirement for strategy change towards stronger customer focus is confirmed. The industry's focus in its efforts to maintain its competitive edge has been on cost efficiency. The industry's strategy is raw material oriented, concentrating on bulk production. In searching for growth, focus has been on low cost strategies based on market penetration. UK mills refocus on the house building market with structural timbers.

Product policy has been characterised by technical product improvement and differentiation rather than product diversification and innovation. Product diversification is used to move into new markets which are the domains of present client industries, but remanufactured products still account for less than 10 % of the exports. An extensive size and quality range is sold as standard products via agents and representatives to importers and other intermediaries.

Chapter 7: Integrating local forestry and wood products manufacturing. Cases illustrate the role of product and customer focus, long-term buyer-seller relationship, locality and cross-sectoral collaboration. Reference is made to a large-scale vertically integrated sawmill (Finland) as a means to safeguard high-grade timber supply. The question how to safeguard the utilization of full-range high- to low-grade timber assortments in view of decreasing returns from sawing low-grade timber is crucial for the availability of high-grade timber resources for secondary wood processing industries.

An example (Wales) is given for developing a supply chain tying local timber resources to consumer demand for high value wood products on a basis other than cost advantage. Another example (Wales) is given for diversifying the use and increasing the value of a local timber base by developing and introducing to a new market new structural wood products. A further case (Austria) is presented for the horizontal and vertical collaboration between forest owners and a producer network of small Austrian sawmills. Horizontal collaboration creates producer value, by backward integration the availability of the certified timber attributes is assured.

Chapter 8: Market entry barriers for modern timber frame solutions. There are no direct regulatory barriers to timber frame construction methods in residential construction throughout Europe. The main limitations are fire and acoustic performance. In the UK there is equal acceptability and quality perception among property valuers, lenders and insurers for modern timber frame and other construction. The absence of a standardized building system for timber construction has turned out to be a limitation for structural wood products to enter markets. In Europe modern timber frame construction systems are without legacy of proof and therefore have associated with them a perceived risk. In Finland timber frame system suppliers are reluctant to enter BtoB markets under developer-led contracts.

Chapter 9: Innovation in timber frame construction as related to the wood products supply chain. There are business opportunities in housing markets for timber frame solutions in Europe. Markets benefit from economic and legislative development. In the UK there is rapid growth in demand for off-site prefabricated timber frame systems. In Finland there is a prospective shift in housing demand that is expected to open up a new market.

There is a need for innovation in timber frame construction and related supply chain management. Long-term partnering will replace project-by-project competitive

tendering. The UK construction industry is renewing the product delivery processes around the four key elements of product development; project implementation, partnering the supply chain and production of components. In terms of product and process development, entering new markets will require also the development of new products and related core design concepts, industrialized manufacturing methods, improved supply chain performance, best practice building systems and procurement schemes.

Strategic partnerships with large customers might open up opportunities for sawmills to strategically reposition themselves. Challenges lie in production and logistical networks of developers as lead companies and SMEs as partners of their supplier networks and further in organisational innovations addressing the complexity of urban housing construction projects. Technical change in building construction towards off-site timber frame construction implies organisational change in related production networks, which does not only comprise the construction products' production system, but also the building design and on-site construction processes. Developing related skills and craftsmanship needs educational support.

The design-bid-build project delivery approach segregates design and construction responsibilities. Applying price performance as the exclusive selection criteria and the prescription of the technical details set limits for the material supplier to develop new technical solutions. The contractual relations are occasional and do not allow appropriation of the full benefit from learning-by-repetition. Liabilities are marked-off by works and professions and do not conform to building's functional and productional entities.

Chapter 10: The development of modern methods of construction and timber framed housing in the UK. Product and management innovation related to modern methods of housing construction (MMC) had a major impact on the growth in use of timber frame houses and wood products in the UK. An overview of the development of timber framed housing (TFH) in the UK, its competitive advantages and the reasons for its growth is provided. The TFH industry is presented as an example for the successful integration of the wood products industries into the housing construction supply chain.

Chapter 11: Public programmes and partnerships in support of new wood product technologies and value chains in Finland 1992-2006. In Finland public research programmes have been focused on providing financial support and

expertise to companies participating in research and development projects with high technological and business risks. **Starting in the early 1990s public policy has** been targeting innovation in wood applications, process technology and business management. Government initiatives were launched to establish expert networks and to promote SME supplier network creation. Promotion campaigns were launched in order to support more favourable demand conditions for wood applications.

Chapter 12: Suggestions for policy action and further research. R&D in structural wood materials is essential to meet the challenge posed by concrete and steel. For the wood products industries technological process innovation as well as developing customer-supplier relationships and supply chain management will be of top priority. The low R&D intensity makes it difficult to explore niche markets of high technological opportunities. The question is how to encourage firms to get committed to radical, science-based innovation and to apply new technologies. Nonetheless, these industries are not in a disadvantaged position in public R&D funding. New entrepreneurship could be a means to explore these technological opportunities.

In the prevailing business environment there are few incentives to set aside resources for the development of completely new products and business areas. Technology diffusion supports innovation and should be fostered by network-facilitating policies across industries. Gatekeepers are important in their role as intermediaries between scientific institutions and firms. The lack of immediate contact with the end user is a general obstacle for development. Innovation policy must be aware of the importance of collaboration and process integration with customers and suppliers.

The wood products industries are domains of small firms. Small firms generally lack the competence to implement differentiation or focusing strategies. For small companies to access markets for value-added products requires joining forces in collaborative supplier networks. Policies should address bottlenecks in product innovation, marketing competencies and business resources as well as inter-firm collaboration.

There are no direct regulatory barriers to timber frame in residential construction, varying practices across countries, nonetheless, complicate market access. Therefore the EU harmonisation process should proceed. Eurocodes are still in limited use. In PPP markets SMEs may suffer from discrimination. Small businesses have experienced a failure of government organisations to work collectively together.

There should be a study at the European level properly addressing the importance of market entry barriers related to networking, the technical construction process and the supply chain for timber frame construction.

1. INTRODUCTION

1.1. Objectives

The main objective of the COST Action E30 is to gain a better understanding of the problems and possible solutions to forest-based entrepreneurship in small-scale forestry, wood processing and non-wood forest products and services aiming at improved employment and income in rural areas.

One of the three working groups of the Action was established to address the questions related to the supporting and limiting factors for enterprise development in wood-processing industries. The major questions pinpointed here are the low performance of these industries in terms of technological innovation, customer focus, integration and vertical collaboration along the wood products value chain.

The examinations and discussions in the working groups should be guided by the three main questions posed by the Action, namely (1) what are factors affecting the competitiveness of the forest wood and respectively the forest non-wood value chain, (2) what are barriers to entrepreneurship, and (3) what are problems for enterprise development. In doing so a multi-country perspective should be applied.

The focus in this report is more on development in business strategy, business-to-business and customer-supplier relationships and less on enterprise development. It does not argue about the role of large or small enterprises, incumbents or entrants to the industry, or various business networking models in the development process. The setting and entities for the examinations on innovation and collaboration are the industries concerned in their present composition. New entrepreneurship is not particularly considered, although its role for innovation and exploitation of niche markets is recognized.

According to the subject area to be covered by subgroup "Timber frame houses" the industry focus is refined to the more specific business activities in the timber frame construction value chain. Compliance with the request for a multi-country perspective was achieved in terms of conclusions based on a comparison between Finland and the UK.

1.2. Scope

Market focus

Market focus is the use of basic wood products, structural components, timber structures or whole timber frame system solutions for building construction. The domains of timber frame construction in Europe are detached and terraced dwelling houses; more commonly secondary residential houses (chalets, cabins) as well as gazebos, saunas and other yard and garden buildings. Timber frame is used also in agricultural, industrial, business office and public buildings as well as multi-occupancy multi-storey residential buildings. In these building categories the market shares of timber frame in Europe are rather small although rapidly growing in some countries as Ireland and the UK (especially Scotland).

The special focus of this report is on BtoB markets related to developer-led timber frame housing construction supply chains. BtoC market-related manufacturing of timber structures for single-family homes or home kits for self procuring builder-owners is outside the scope of the work. These markets, nonetheless, are important, but at least in the Finnish context, they are already dominated by timber frame and characterised by efficient and well-functioning supply chains.

Box 1. Business-to-business construction market

The business-to-business (BtoB) timber frame construction market comprises a) prefabricated large-size wall, floor and roof structures for industrial, business office and public buildings and structural timber elements for multi-storey, terraced and semi-detached dwellings delivered to professional builders and contractors or turn-key, make-to-order or assembled-to-order solutions for developers and investors in social housing or private (speculative) markets.

Industry focus

The “timber frame construction value chain” or “timber frame value chain” is defined here in a broad sense to consist of the wood products industries covering both the manufacturing of basic wood products and their remanufacturing into structural components and timber structures and related upstream forest-based activities with the building construction industry as its ultimate customer industry (Figures 1 and 2). Logistical and construction service providers as well as intermediaries have an important role in this value chain although they are not considered here.

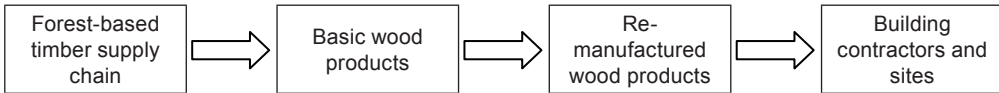


Figure 1. Industries in the timber construction related supply chain.

| | |
|--|---|
| Construction services architectural design, structural engineering & contracting services to housing developers, construction companies or self-procuring builder-owners | |
| Integrated timber construction system solutions precut stick-frame systems, panelised systems, volumetric systems for timber-frame homes, high- / low-rise single- / multi-storey residential buildings | |
| Timber structures – System components deliveries of subsystems, load-bearing frame structures: truss, subfloor & wall structures & elements, roofing, partition wall structures, eaves, exterior & interior wall coating, floor coating, windows, doors incl. casing, staircases, handrails, terraces | |
| Timber structure components glulam beams & pilars, I-joints, siding boards, rafters, mouldings, wood panels, tiles etc. | |
| Structural timber products | |
| <p style="text-align: center;">Sawn timber products</p> <p>specialty sawed (heartwood split), cut-to-customer lengths, stress graded, kiln heat treated, planed, surfaced, finger-jointed, moulded, preformed, preservation</p> <p style="text-align: center;">Standard sawn timber</p> <p>rough-cut, green-dry, standard size</p> | <p style="text-align: center;">Engineered wood products</p> <p>plywood, particle board, fibreboard, LVL, glulam, OBS, PSL, OSL, etc.</p> |
| <p>Timber raw material</p> <p>residues from sawmilling and planing solid timber sourcing: standing timber selection, logging, scaling & bucking veneer and lumber production: normal-sized, small logs from final cuts or thinnings EWP, pulp, bioenergy production: lower-end quality fractions</p> | |

Figure 2. Products and services of the timber construction supply chain.

In the basic wood products manufacturing industry (primary wood processing) sawmilling unlike EWP manufacturing is being dominated by small and medium sized enterprises although polarization and consolidation towards larger establishments are characterising the industry in some cases. There is a focus on non-integrated family-owned sawmills rather than large multi-national integrates in the observations presented below concerning strategy, product policy and innovation behaviour of the sawmill industry. The secondary wood processing industry as the supplier of “remanufactured structural wood products” in many cases is being split up into a

large number of small firms and a small number of large firms with a dominant share of the industry's gross output. Both industries are considered here as far as they are related to building construction.

Product focus

In industrial classification schemes (SIC) the wood products industries are defined to include the production of sawn timber, which may be further processed by planing and impregnation, engineered wood products (EWP) and builders' carpentry and joinery (Figure 3). Builders' carpentry and joinery includes off-site prefabricated wooden buildings or their structural frame components and other structures such as doors, windows and their casings, stairs, rails, floor, roof, and wall constructions.

The term "basic wood products" refers to structural sawn timber, wooden panels and other engineered wood products. "Remanufactured wood products" refer to structural wood products, structural components or complete structural systems as secondary wood products.

| |
|---|
| SIC 20: WOOD PRODUCTS (EXCL. FURNITURE) |
| SIC 201: Sawn timber, rough, planed, or impregnated |
| SIC 202: Engineered wood products |
| SIC 203: Builders' carpentry and joinery |
| SIC 20301: Prefabricated wooden buildings |
| SIC 20309: Other builders' carpentry and joinery |
| SIC 204: Wooden containers |
| TOL 205: Other wooden, cork, and corded products |

Figure 3. The wood products industries according to the standard industrial classification scheme (SIC).

Main topics

The competitive advantage of firms in the wood products industries relies on well functioning production and management processes and related process technology. The reason is the dominance of bulk products being sold to anonymous customers. Traditionally, it has been typical for every participant in the chain to develop its own independent operation, resulting in the separate development of their competitive edge. This method of operating has established no immediate contact with the end user. The point of contact between players is reduced to the status of handing-over a standardized product (Kairi 2005).

We adopt the view that a major question for development is related to the reconfiguration of the forest-based timber supply chain and the creation and further development of the remanufacturing wood products industries as an intermediating link between the basic wood products industries and the construction industry, which for major emerging markets is presently weak or non-existing (Brege et al. (2005), Kairi (2005) and Ollonqvist & Rimmler (2005) for Finland and Sweden). As an example for successful strategic repositioning, vertical diversification and forward integration of sawmills we refer to sawmills operating in the value chain for timber framed housing in the UK market (Chapter 10).

The integration of activities of the value chain and the configuration of linkages is a major source of competitive advantage. A major topic addressed in this study, therefore, are customer-supplier relationships; how much value the wood products industries place on known customers' needs, and how focused and integrated towards their customer industries they are. In other words, what is the role of customer focus as an integrative element in developing the industries' business operations?



Figure 4. Framework of reference.

Another main topic is the wood products industries' innovation performance and how it relates to the industries' business environment and business strategy. Special focus is placed on the sawmill industry's product policy. Other main topics are the barriers to and incentives for innovation and limitations for modern methods of timber construction to enter construction markets.

This report is drawn up according to the framework of reference presented in the Figure 4.

2. THEORETICAL BACKGROUND

2.1. Factors of competitive advantage and business performance

In explaining rent-yielding business performance of firms the resource-based and competence-based views put focus on strengths and weaknesses internal to the firm. Differences in performance across firms are mainly caused by differences in resource endowment and competencies of firms and less by the business environment they operate in. Resources not equally available to all firms are the precondition for a firm to yield a sustained superior rent as compared to rivals. In the resource based view sustainable competitive advantage rests with the ability to control rent yielding resources (Penrose 1995, Foss 1997). The most important resources according to the competence-based management theory are intangible competencies and the dynamic capability of firms to create them (Praest 1998).

In Porter's view a firm's business performance is predefined by factors originating in the external environment, not internally within a firm. Porter stresses the importance of strategic positioning of a firm into its business environment. In his cluster approach towards the sources of competitive advantage Porter underlines the role of related and supporting industries as well as factor and demand conditions. In his value chain approach the integration of activities of the value chain and the configuration of linkages towards suppliers and customers are a major source of competitive advantage and value creation. Combining Porter's view that performance is predefined by factors originating in the external environment of the firm with the resource-based and competence-based views probably provides a better description of the real world.

2.2. The concept of innovation system applied in sectoral analysis

In Porter's line of reasoning innovation performance should be not only conditional to internal factors but to a major extent also on framework conditions external to the firm and the strategic positioning of the firm into its business environment. Palmberg (2001)

confirms that innovation is dependent not only on technological opportunities, but also on a supportive regulatory and competitive environment. Because the business environment can be expected to explain innovation behaviour this must be taken into account in innovation related policy formulation.

For a study looking for the determinants and patterns of innovation of an industry the concept of innovative system is a helpful guide. The innovation system approach touches Porter's view in that it recognizes the importance of the business environment for the innovation performance of a firm. Applied to sectoral comparative analysis the innovation system approach highlights the key dimensions of the innovation process at the level of an industrial sector, which namely are technological opportunities, appropriability conditions, cooperation, demand conditions, competitive regime and the institutional framework surrounding an industry (Castellacci et al. 2005, Breschi and Malerba 1997, Malerba 2002, cit. 2004).

One dimension of the innovation process concerns the cooperation between different organizations such as customers, suppliers and competitors, R&D, financing organizations and government agencies. Later on we will deal with this dimension in terms of supply chain integration, customer-focused business strategies, public development programmes and R&D private public partnerships (Chapter 11). Another dimension refers to the institutional framework, the "rule of the game". We will deal with this dimension in terms of market entry barriers for modern timber frame solutions in housing construction markets (Chapter 8). The third dimension comprises characteristics defining the technological opportunities or the ease of innovation and the appropriability conditions or the degree to which firms can obtain economic returns to innovation investments (Chapter 5). The fourth and fifth dimensions are demand conditions and the competitive regime, which have also been put forward by Porter as determinants of competitive advantage in an industry (Edquist 1999, Lemola and Palmberg 1999). We will refer also to those dimensions in more detail (Chapter 5).

Technological opportunities

Technology "can be defined as those tools, devices and knowledge that mediate between inputs and outputs (process technology) and create new products or services (product technology)" (Tushman and Anderson 2004). Technological opportunities correlate with the ease of innovation for any given amount spent on R&D. In a broader sense, technological opportunities will be determined by the role played by customers or suppliers as providers of innovative ideas, developments in the sciences and the

advancement in equipment and instrumentation originating from other industries, as well as the extent to which firms rely on knowledge inputs from the universities, research institutes or other “bridging institutions” (Klevorick et al. 1995).

Appropriability conditions

Appropriability conditions are a key factor for the amount of innovation in an industry (Levin et al. 1987, Cohen and Levinthal 1989, cit. 1990). They concern the fraction of the returns on R&D that the innovator is able to retain and herewith describe the possibilities of protecting innovations from imitation (OECD 1997, Palmberg 2001, Schienstock and Hämäläinen 2001). Appropriability conditions can either inhibit or support the exploitation of technological opportunities. Appropriability conditions might simply relate to market domination and barriers to entry, or complementary assets in the form of strong ties to suppliers and customers (Teece 1986, Foss 1997). Other means of appropriation relate to product complexity, aesthetics or trademarks and design (Palmberg 2001). In a more fundamental sense, appropriability conditions will also depend on the nature of the knowledge base in terms of the degree that knowledge is tacit or codified, and more easily replicated, or specific versus generic due to frequent knowledge spillovers (Malerba and Orsenigo 1997). Technological opportunities and appropriability conditions jointly determine a firm’s incentive to spend on R&D compared to other knowledge-creating activities.

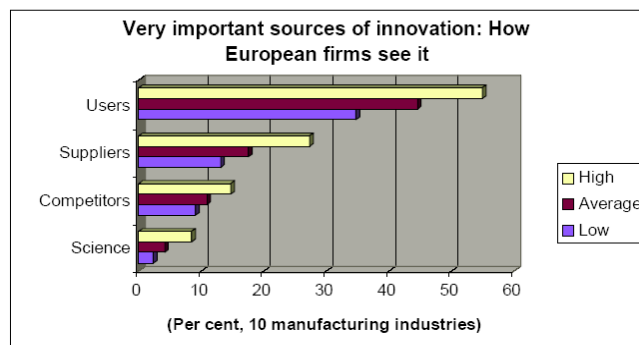


Figure 5. Empirical evidence shows that users have a most pronounced position as a source and implementation environment of innovation (Fagerberg 2004).

The role of suppliers and customers

Porter (1990) stresses the importance of strategic positioning of a firm into its business environment. In his cluster approach towards the sources of competitive advantage

Porter (1990) underlines the role of related and supporting industries as well as factor and demand conditions. In his value chain approach the integration of activities of the value chain and the configuration of linkages towards suppliers and customers is a major source of competitive advantage and value creation (Porter 1985). In fact, empirical evidence shows that users and suppliers have a most pronounced position as a source and implementation environment of innovation (Figure 5).

2.3. The supply chain concept

The term “supply chain” is a figurative reference to the set of activities, usually identified by a company (SBU), including the way they are linked to one another, which are required to create a certain kind of finished product. The term “value chain”, however, has been created by Porter to illustrate value-adding activities and their linkages within a company. In the following the terms “supply chain” and “value chain” are used as synonyms. Conceptually the term “supply chain” tends to be more related to the arranging and managing of activities related to the sourcing of materials and subcomponents, inbound and outbound logistics and production in order to deliver a given customer value at lowest cost. The term “value chain” applies more to an analysis of activities from the viewpoint of how to increase customer value in terms of delivery conditions, product performance and customer services. It is not restricted to activities within a company but extends on how these activities are interlinked with the value chains of customers and material and component suppliers. The practical use of these terms, however, does not always follow the theory borders (Sturgeon 2000).

3. ACTUAL AND POTENTIAL DEMAND FOR STRUCTURAL SAWN PRODUCTS IN HOUSING CONSTRUCTION

The share of timber frame (wood frame) construction in selected European countries in 2001 in terms of number of units of new housing construction completed was 9.4 % (97 thousand units) (Figure 6). The three biggest market areas in absolute terms are the Nordic Countries, Germany and the UK. There are large country-by-country differences between market shares of timber frame. In percentage terms, timber frame accounts for about 40 % in the Nordic countries but less than 5 % in France, the Netherlands, Poland, and Denmark. By including Spain and Italy the approximate average share of timber frame in Europe drops below 5 % (Building Europe 2002).

Single-family and two-family houses are the prevalent types of timber frame dwellings. These housing types account for 87 % of all timber frame dwellings in Europe, while multi-occupancy dwellings account for the rest. While open panel systems are prevalent in the Nordic countries, platform frame is dominating in the UK and solid timber frame is prevalent in Germany. Off-site prefabrication techniques are common in the Nordic countries, the UK and Germany.

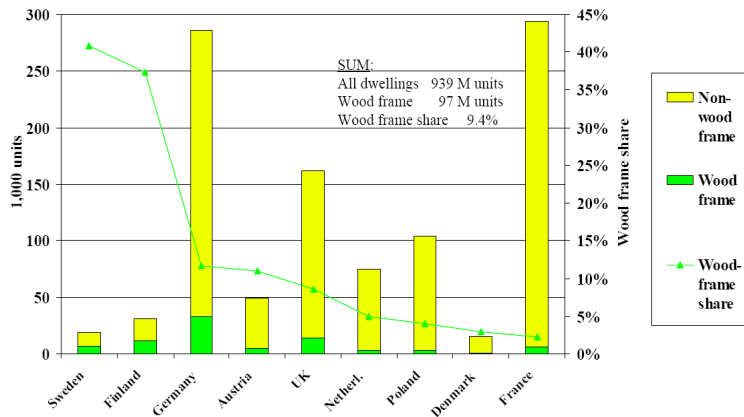


Figure 6. Housing completions by construction type, 2001 (Building Europe 2002).

The consumption of structural sawn products in total new residential construction completed in 2001 (939 thousand units) is approximated to be equivalent to 3.8 million m³ (Figure 7). The consumption of structural sawn products in timber frame construction (97 thousand units) amounted to 1.6 million m³ (Building Europe 2002). Therefore, sawn product consumption in non-timber frame construction on average amounted to 2.6 m³, in timber frame construction to 16.5 m³.

With housing completion numbers remaining on their levels in 2001, a doubling of the market share of timber frame in residential building construction in those European countries, where the present (2001) share is around or below average (non-Nordic countries), would provide a net increase in the demand for sawn products of about one million m³ (Case 1, Figure 7). That means a 27 % increase compared with the actual level in 2001 (3.8 million m³). A quadrupling of the respective market shares would imply an increase of about three million m³ or 80 % (Case 2). In Case 3 the increase in the total number of completions is spread as an equal proportional change (20 %) across all categories.

In Case 1-3 the market shares equally rise for single- and two-family homes and multi-occupancy houses alike (the latter with an average share of 13 % of timber frame completions in 2001). In Case 4 the share of timber frame in multi-occupancy housing completions is raised up to 25 % for the Nordic countries and the UK, and up to 10 % for the other countries, except France, where its share continues to be 0 %. In Case 3 the net increase would be 760 million m³ or 20 %, in Case 4 it would be 190 million m³ or 5 % of the level in 2001.

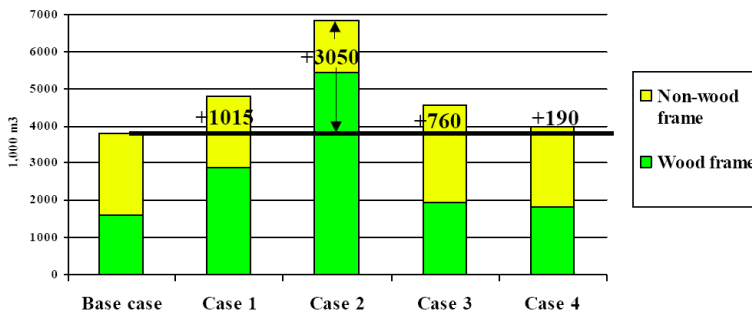


Figure 7. Sensitivity analysis of sawn timber usage in structural applications in new residential construction in Europe (A, DK, D, F, NL, PL, S, SF, UK), 2001 (Building Europe 2002).

4. KEY FEATURES OF THE WOOD PRODUCTS INDUSTRIES

4.1. UK wood products industries

The main primary wood processing industry activities in the UK are sawmilling and panel boards. There are approximately 230 sawmills which supply 15 % of the total UK sawnwood market and 8 panel board plants supplying about 50 % of UK consumption. Both have strong linkages with the rural economy through their purchases of timber. The secondary wood industry accounts for a larger share of the sector's output and have much weaker links with UK forest growers as most of their wood materials are imported. Figure 8 indicates the materials and product flows along the UK timber supply chain to the construction industry which is the largest end using sector for timber products.

Key features of the chain are as follows:

- Secondary wood processing (joinery, timber buildings, components) and timber distribution (merchants, DIY, retailers) account for the largest share of the value chain.

- The timber products industry's inputs of sawn timber and panels are valued at £0.6 billion and outputs at £2.5 billion with an added value of £1.9 billion.
- Timber and builders merchants' inputs of timber products are valued at 3.3 billion, their outputs at £3.5 billion with an added value of £0.5 billion.
- Exports account for a small share of the industries' sales.

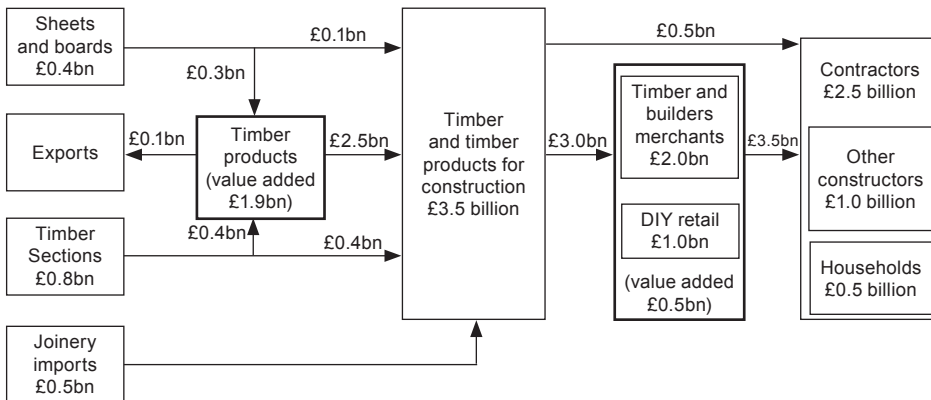


Figure 8. The UK Construction Timber Supply Chain (Davis Langdon Consultancy 2004).

The UK sawmilling industry's output has doubled since 1975 based on increasing sawlog supplies from the UK's maturing plantation forests. The timber harvest will continue to rise over the next 20 years and should support a further 50 % rise in sawn timber production by 2020. Important industry developments include:

- Progressive consolidation of production in large, modern, well equipped mills owned by a small number of companies
- Active product development of building components (eg claddings) and engineered wood products (eg I-beams, acetylated timber)
- Vertical integration into the manufacture of secondary wood products (eg pallets, roof trusses, floor systems)
- Investment in overseas sawmilling.

The UK panel board industry (chipboard, OSB, MDF and cement bonded chipboard) has been the fastest growing part of the primary industry over the past 10 years. All but one of the plants is owned by one of the European / North American panel conglomerates and their future development will depend on the competitiveness of manufacturing in Britain compared with alternative locations, particularly Eastern Europe.

The wooden joinery industry employs twice the number of people and has a turnover 50 % larger than the sawmilling and panels industries combined. The industry is made up of a large number of small companies and a few large companies producing mainly mass produced windows, doors and kitchen fittings. The small companies tend to specialize in bespoke joinery products. Added value per employee is higher in the larger companies but for the industry as a whole is lower than in sawmilling and panel boards and also in comparison with the wooden joinery industries in Germany, France and the Netherlands. The import share of joinery products is low (estimated at 10 % in 2000) but is growing particularly from Scandinavia, Eastern Europe, Malaysia, Indonesia and Brazil.

4.2. The Finnish wood products industries

The Finnish wood products industries are characterized by the dominance of basic products with a share of about 80 % of the industries' total gross output. Basic products include sawn products, plywood and LVL. The core competencies of companies are in bulk production technology. Remanufactured products - products that include building joinery, house and furniture industry products - account for about 20 % of the industries' gross output. This product group is the domain of SMEs operating mainly in the domestic market. There is a polarization in the sense that the large companies produce basic products mainly for the international market, whereas small companies produce remanufactured products for the domestic market (Kairi 2005).

About 50 % of sawn timber is produced by non-integrated family-owned sawmills. The other half of the industry's output is accounted for by integrated companies producing also pulp, paper and paper products with a comparatively low raw material recovery and a wide range of bulk products for unsegmented export markets (Saarikivi and Riihonen 2003). Until recently sawmills have concentrated on a non-segmented range of products of varying size and quality (Kairi 2005). The total gross value flow of structural wood products (sawn products and wooden panels) in the Finnish timber supply chain amounts to 3 500 million € and an equivalent material flow of 2.7 million m³ (Figure 9).

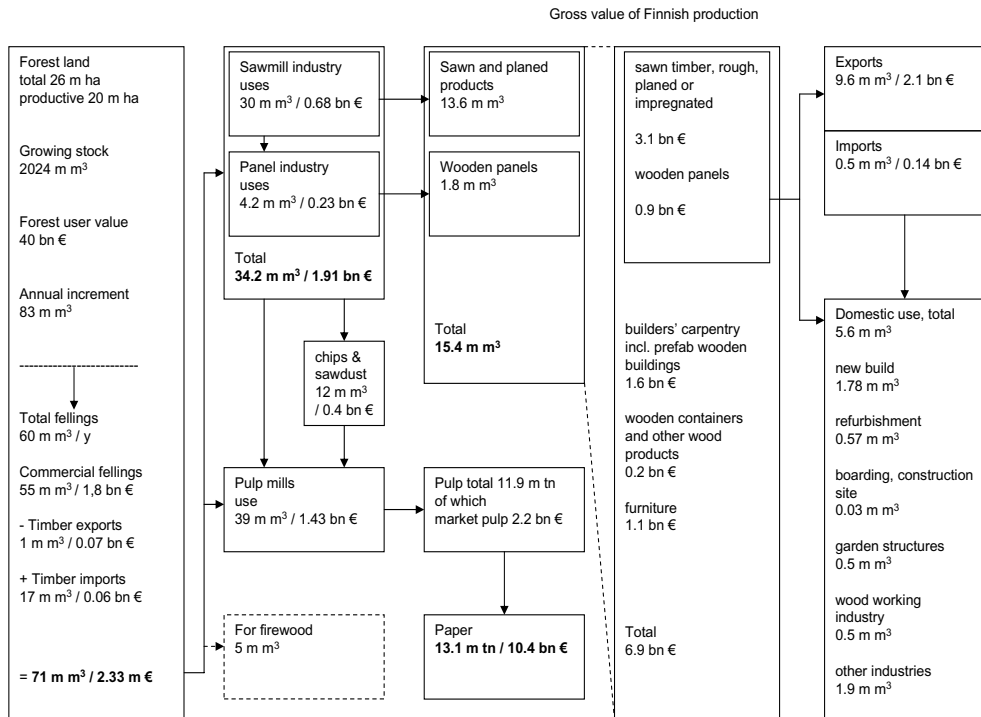


Figure 9. The Finnish forest-wood chain (The Finnish Timber Construction Development Programme 2004-2010).

4.3. Common features of the UK and Finnish wood products industries

The industries in both countries are dominated by basic products. In both countries the basic wood products industries are weakly integrated into further processing towards structural timber products and system components. The manufacture of structural products indicates a low degree of prefabrication and a low degree of integration into construction as its client industry. There is a lack of sub-product and component suppliers that could serve construction companies and drive product development according to perceived client needs. Basic wood products manufacturers have less contact with on-site operations than concrete industry companies, which as subcontractors provide these components to the builder themselves (Kairi 2005).

In the case of the UK, however, a distinction can be drawn between the industries using domestically grown logs and those using imported timber. The UK sawmill industry can be characterized by a low degree of integration, although the more dynamic companies are integrated with the construction industry especially with manufacturers of timber framed buildings. There are, however, companies using

imported timber, which have supplied the construction industry with wood based components for many years. For example most of the companies making prefabricated roofs (trussed rafters), which have been the main form of roof construction for houses and light industrial and commercial buildings for 20 - 30 years, are importing timber. Some of the large wooden window and door manufacturers are part of construction industry groups.

The limited ability for reacting to changes in the market is recognized as a relevant and important point concerning the wood products industries in both countries, where small firms typically start up with the implementation of some invention or product idea, but further on fail to keep-up with changing markets and customer needs. Resources are primarily allocated into machinery and equipment; marketing is not seen as a strategic asset. Small firms do not dispose of marketing competencies to implement differentiation or focusing strategies. Generally there are insufficient competencies in marketing leadership (Enroth 1995). For small companies in the wood products industries to access markets for structural products and subsystem deliveries requires joining forces in collaborative supplier networks (Paajanen et al. 2004).

5. THE EXTERNAL BUSINESS ENVIRONMENT AND INNOVATION BEHAVIOUR OF THE WOOD PRODUCTS INDUSTRIES

5.1. The technological and economic dimensions of the business environment

It was stated in the second chapter that innovative behaviour of firms in an industry multi-dimensionally reflects their external business environment. The dimensions that define the nature, direction and rate of innovation are commonly referred to as the technological opportunities, appropriability conditions and market conditions that characterize different industrial contexts.

5.2. The wood products industries are a mature industries offering few opportunities for product innovation

The product portfolio of the sector as a low-tech industry is dominated by simple, non-complex mature products. The sector is seen to be in the maturity phase of its technology life cycle (Figure 10). In the short run there is no sign indicating revolutionary breakthroughs in technologies or products, which would profoundly change the competitiveness of wood products in the market. The improvements in the quality of wood products can be expected to be small (Finnvera 2003). Although the wood products industries are offering only small technological opportunities,

there might exist “pockets of demand” in specific product niches (Harrigan and Porter 1983).

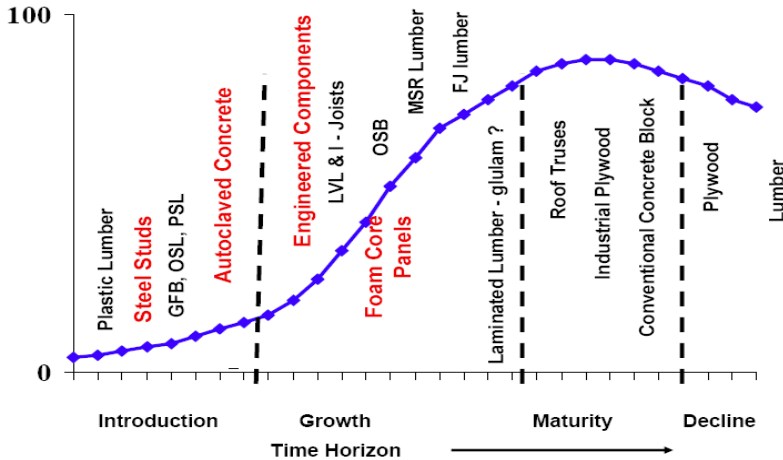


Figure 10. The construction product life cycle (Schuler 2002).

5.3. Risk-avoiding behaviour reduces odds of radical innovation

Firms striving for radical innovation are facing a high risk (Figure 11). The higher the degree of novelty the higher the risk of failure (Kairi 2005). The industry’s risk-avoiding behaviour generally excludes explorative innovation policies from being a viable business policy in this industry (PalMBERG 2001). This reduces the chance for radical innovation.

| Markets | Products | | | Risk + → |
|-------------------|-------------------|-----------------|-------------------|----------|
| | Known to the firm | New to the firm | New to the market | |
| Known to the firm | 70 % | 50 % | 30 % | Risk + → |
| New to the firm | 40 % | 20 % | 10 % | |
| New to the market | 20 % | 7 % | 1 % | |
| | Risk + → | | | |

Figure 11. Relative amount of successful products (Kairi 2004).

5.4. Ease of imitation and procurement policies effect adversely product innovation

It is argued that in the wood products industries products are of low complexity and are therefore easily imitated. Because of the low-complexity type of products the return from investment into product R&D is low. Protecting product innovation by patenting might even have adverse effects through the isolation from competition in specific market segments. Instead, firms have to resort to other means of safeguarding and appropriating their competencies for value creation. Competition coupled with the absence of technological opportunities and weak appropriability conditions explains the low degree of novelty of products and the low priority of product innovation in the firm's innovation activities (Palmberg 2001).

Related to the Palmberg statement, it is arguable that smaller innovative SMEs in the timber industries will invest in their own process rather than the patent process. Indeed even some 'high-tech' SMEs; e.g. 'Invertek' (a UK manufacturer of inverters for motion control); prefer to invest in continuous R&D rather than tie up capital in patents which are anyway difficult to protect, especially in the developing economies of Asia (Dauksta 2006).

5.5. Competitive regime impinges on the sectoral pattern of innovation

The markets for wood products can be characterized as saturated. Although in these markets overall growth is slow, growth in market share of single firms is often achieved by market penetration with the present products. A differentiation strategy focuses more on purchasing conditions and customer support and less on core product performance.

The minor performance of the industry in product innovation is also explained by the fact that under the prevailing competitive regime efficient production methods are the main source to uphold short run profitability. It is more profitable for firms in the short- run to further develop existing technologies and there is less incentive to put aside resources for the development of radically new products (Palmberg 2001).

The fact that new products tend to develop incrementally and are of the low-complexity type does not imply that the business practices of the firms in the industry are easy to imitate. Complementary activities fend off competition. Among those are branding, trademarks, governance of marketing channels, distribution chain and retail outlets.

6. STRATEGY, PRODUCT POLICY AND INNOVATION BEHAVIOUR OF THE SAWMILL INDUSTRY

6.1. Portraying the sawmill industry

The intention has been to compare the sawmill industry across Europe to reveal uniform features in its strategic behaviour. The results of a comparison between the sawmill industry in Finland and the UK, which was done before the background of a description of the sawmill industry in Finland, confirmed that evidence from Finnish sources can be generalized in many respects to fit for the sawmill industry in the UK as well. Besides common characteristics, distinguishing features fitting only for the Finnish or UK sawmill industry were also found (see also Chapter 10 on UK sawmills in the timber frame housing construction supply chain). The conclusions of this analysis suggest requirements for strategy change towards stronger customer focus.

6.2. Business strategy

The sawmill industry's strategy has traditionally been raw material oriented in that it has been focused on cutting the logs into standardized products with an optimal raw material utilization ratio. The industry is concentrating on bulk production and product-based segmentation did not emerge until the 1990s (Kairi 2005). In searching for growth the sawmill industries in both countries have placed emphasis on low cost strategies focusing on productivity improvement. The means to achieve this have been scale economies, process development, lumber recovery improvement and import substitution of raw material. Recovery improvement and waste reduction could be achieved by developing and investing into new sawing technologies - for instance curve sawing - and sawing of small diameter logs.

The sawmill industry's growth strategy has been focused if compared to generic strategy options according to Ansoff's (1957) product-market matrix in the sense that it concentrated on present market penetration. This has been the case in the UK and in Finland as well. In Finland the growth strategy of mills has mainly relied on market penetration in export markets and expansion into new geographic market areas, mainly retaining their unchanged product lines for known customers and not by addressing new customers' basic needs. The UK industry's growth strategy has focused on penetrating the house building market with structural timbers which until the 1980s were virtually all imported. The industry has applied a differentiation strategy to some extent. Here attention has been on product quality, customer support and purchasing conditions in terms of price policy, terms of delivery, distribution and lead time.

6.3. Product policy

Product policy is an important means for a company to achieve and defend its targets for its market position in terms of sales and market share and the profitability of its business as well as to mitigate risks related to market demand and new competitors. For a company continuing to operate with present products (product conservation) in present markets productivity gains are the means to maintain a sufficient profit margin (Figure 12). Product modification means improvement in product quality (product improvement) or a larger variety of products with differentiated attributes to fit closer the different customer needs in present markets (product differentiation). Horizontal diversification means an extension towards new products which are related (complementary) or unrelated (lateral) to the present products. In the sawmill industry vertical diversification is directed towards further processed or remanufactured products. Product elimination is a decision to depart from markets for example by giving up low-end products. A new product qualifies as product innovation if it is based on a new technology with improved performance characteristics that implies major changes in the firm's knowledge base.

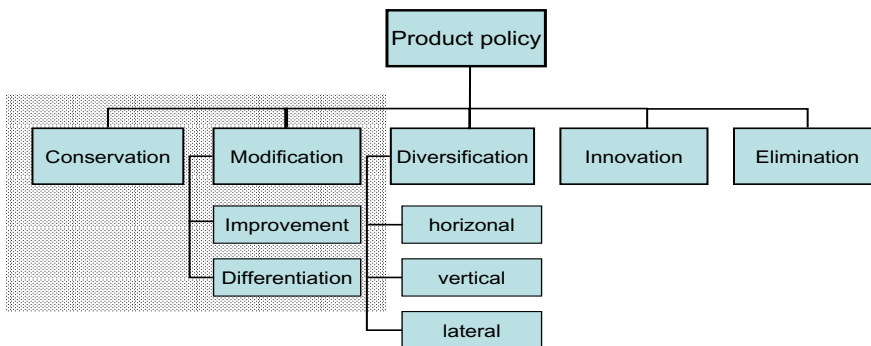


Figure 12. Categories of product policy options (Thommen and Achleitner 2001).

In its product policy the sawmill industry has been characterized by product improvement, product differentiation rather than product innovation. By product improvement and differentiation the industry responded to special needs of customer segments in present markets by new or improved product attributes. It meant moving from commodities towards specialties such as specially dimensioned, strength-graded construction lumber (e.g. for the Japanese market) and “preforms” for carpenters and specific applications for the furniture industry. Product diversification should reduce the dependency from the world market price for bulk sawn timber, an example here

might be sawmills taking glulam products for log home manufacturers or construction carpentry and joinery products into their product line. Remanufactured products, however, still account for less than 10 % of the exports e.g. in Finland (Kairi 2005). Product improvement is often triggered by process innovations for example in kiln drying, defect detecting and strength grading technologies.

Product improvement and differentiation has characterised probably the major part of product development activities. There are also cases of vertical diversification as a strategy to move into new markets which are the domains of present clients (forward) or suppliers (backward). For instance in Finland Pölkky Inc. is a producer of lumber that is further processed into floor and wall panels, outdoor deckings, construction products for joinery, the construction industry, and the furniture industry. Other examples are the Kuusisto Group, Koskisen Inc., PRT Forest Group and Versowood Inc.

Examples of vertical diversification by major UK sawmilling companies are BSW Timber into outdoor deckings, James Jones & Sons into manufacture of joists and wood pallets and Balcas Timber into the supply of wood pellets for wood based energy systems. An example is also the joint venture between a major UK sawmill with a timber frame housing manufacturer (Chapter 10). From a manufacturing viewpoint this has required investment in new sawmills mainly using Scandinavian / North American designs and equipment including mechanical strength grading, kiln drying and preservative treatment. It has also required major efforts to establish a new customer base and integration of suppliers of UK construction timber into the timber merchanting network.

6.4. Customer focus

There has been no major change in customer segmentation. In export markets the distribution channels for sawn timber marketing have traditionally been long. Still an extensive size and quality range is sold as standard products via agents and representatives to importers and other intermediaries (Kairi 2005). In domestic markets the customer segments are industrial users and independent lumber merchants.

6.5. Summary and conclusions

The sawmill industry's focus in its efforts to maintain its competitive edge has been mainly on process efficiency, which improved its cost performance. Since the technology has been developed similarly in competing countries, it has become

increasingly difficult to maintain a sustainable competitive advantage on production technology alone. There are threats from substitutes.

For the sawmill industry, as a mature industry, it is business strategy and related process innovations instead of product innovation, that are necessary to meet the strategic vision for a market-oriented business model for the industry. The sawmill industry's product policy has been focusing on product improvement, variation and differentiation, to some extent on product diversification, but rarely on product innovation. In order to implement a specialization strategy and market-oriented sawmill operations based on product groups it is necessary to modify the prevailing raw material focused operating practice and to adopt a new strategic approach (product-group approach, see Finnish Profitable Sawmill project). Market orientation requires especially also the restructuring of the distribution channel and wood raw material supply chain from the forest to the mill into product focused, selective and integrated wood procurement (Klus and Hirvensalo 1997).

Box 2. The Finnish profitable sawmill project

In the 1990s, the Profitable Sawmill project (KANSA) was established as a key project within the Finnish PMT technology programme. It made a central contribution for strategic change within the Finnish sawmill industry. It laid out the principles for market-oriented sawmill operations, based on product groups. First, the product segments that were relevant for Finnish sawn timber were determined by means of market research along with their requirements for the properties of wood, then production processes were devised for the new product groups, and finally issues relating to the supply of optimal raw material in Finnish forests were addressed. This meant modifying the prevailing raw material centred operating practice to adopt a product group-focused approach to sawmill operations. The outcome of the project was a clear indication of better profitability for sawmills specialising in product groups as compared to the traditional bulk production sawmills. The project led to a number of subsequent development projects, concentrating on product-focused, selective wood procurement and harvesting automation, on transport to sawmills using only one wood species as well as on integrated information systems to enable the sawmills to better manage the entire delivery chain from forest to products. These have all been implemented in the sawmill industry, although bulk sawing remains to the present day a common operating practice. Examples of the outcomes for R&D carried out in companies include productivity increases by means of automation. (Kairi 2005, Klus and Hirvensalo 1997)

7. INTEGRATING LOCAL FORESTRY AND WOOD PRODUCTS MANUFACTURING

7.1. Benefits of long-term timber buyer-seller relationship and the economic value of vertical integration

Resources not equally available to other firms are the precondition for a firm to yield a superior rent as compared to its rivals. Timber is a main tangible resource in the wood products industries, especially in lumber manufacturing which constitutes a final processing stage of raw material. Product policies focusing on product quality and further processed and customized products impact on how the linkages from the mill towards timber suppliers and forest operations are to be configured.

Long-term timber buyer-seller relationship reduces the sellers' uncertainty about timber demand and reduces transaction cost of negotiation. The high frequency and predictability of transaction creates incentives to invest into transaction-specific tangible and intangible assets for cost reduction in forest management and harvesting. Nearby locality facilitates communication and socialization, therefore, firstly, reputation prevents opportunistic behaviour and, secondly, mutual adjustment and standardization of norms will reduce transaction and production cost (Douma and Schreuder 2002).

A face-to-face seller-buyer relationship involves interpersonal attributes and commitment to ethical behaviour (Sande 2003). A high frequency of transaction provides an opportunity for costs to move down the learning curve. In sawmilling moving from bulk production towards selective product-groups for a limited customer segment means also shifting towards selective, product-oriented procurement practices in sawlog sourcing (Paajanen et al. 2004). The following cases illustrate varying practices of integrating local forestry into wood products supply chains.

7.2. Supply chain integration – the case of PRT Forest Group (Finland)

PRT Forest Group is the second largest provider of prefabricated timber frame houses in the Finnish BtoC market for single-family homes accounting for 70 % of the group's turnover. Besides panelized and volumetric systems the group provides also log structures. The group owns 100 % affiliated domestic sawmilling capacity of about 130,000 m³. Finndomo, as the largest provider of prefabricated wooden family houses in the country, on the contrary, does not own sawmilling capacity but rather relies on other supply chain governance structures.

In the case of the PRT Forest Group it can be hypothesized that the local purchasing and processing of a comprehensive number of timber grades is a means to tie forest owners to delivering high-grade timber, which is a critical element of the differentiation strategy of the company's wooden house business activities. The closeness of ties to local forest owners as timber suppliers assures the supply of specific timber grades, dimensions and quality that is most important for the log house industry activities of the group. Access to high-grade timber resources is safeguarded by purchasing also low-grade timber as a "by-product". Grades not further processed are disposed to the market after primary processing. Close ties reduce acquisition costs. Sawmills often are faced with information insufficiencies due to passive selling behaviour and geographical scatter of timber-selling private forest ownership which constitutes a source of domestic timber generally most important for Finnish sawmills. Timber supply logistics can respond better to sudden changes in demand conditions.

The opening-up of timber supply from non-local forest resources due to reduced harvesting or transportation cost or timber imports, or a product or process innovation related to wood processing (e.g. use of small-sized logs for glulam products) increases the opportunity cost of local timber purchases and provides an incentive to break up vertical integration towards upstream sawmilling activities. The improvement in the availability of alternative timber resources makes production less tied to local forest owners and hence renders the sawmill dispensable. Along with the declining value of local timber resources the market value of the mill is also reduced.

7.3. Developing a timber products value chain to support woodland management – the case of Coed Cymru (Wales)

This is a description of a project based in Wales which aims to integrate small scale woodland management with timber processing. It focuses mainly on hardwoods. It is in contrast to the Finnish and Austrian examples as it is small scale.

For the past 200 years most of Britain's hardwood timber has been imported from Europe, N America and the tropics. This has led to the growing neglect and degradation of native broadleaved woodlands and a decline in the hardwood industries and crafts using this resource. In Wales these unmanaged woodlands contain substantial quantities of small trees (15 - 30 cm diameter at the breast height) with poor stem form. Traditionally this sort of timber has been considered of no commercial value and either left standing or at best sold as firewood. However if these trees are harvested

and used in high value products they will provide income to the owner and a means of improving the quality of the woodland.

Coed Cymru (Welsh Woods) was established in 1986 to help bring about the regeneration of these woodlands by this means. It has done this by creating a value chain starting with the woodland owner and running through to the end user of Welsh manufactured timber products. To establish this chain Coed Cymru has four key programs:

1. Advising woodland owners on silviculture and woodland management appropriate to these degraded woodlands
2. Developing timber processing techniques suited to Welsh timber
3. Developing new products and markets
4. Establishing supply chains for Welsh timber.

Innovations in processing the timber have included the development of sawing techniques for small logs; the design of interlocking engineered timber profiles suited for use in joinery and furniture manufacture; investigating heat treatment of Welsh hardwood timbers for improved durability and dimensional stability; and the development of low cost, small scale finger jointing and laminating systems.

A wide range of products has been developed around the use of these hardwoods and the processing innovations. These include various items of furniture, laminated hardwood windows, end grain and strip flooring and exterior claddings. Some of these products have been used in the recently opened Welsh Assembly building (Welsh parliament).

To encourage commercialization of these ideas and products potential users need access to a ready supply of suitable timber. To ensure this Coed Cymru has established two timber supply depots where stocks of Welsh hardwoods are held. Woodland owners have been encouraged to certify their woodland to FSC standards so that if required buyers can obtain certified material.

Drawing on the work of Coed Cymru there are now several examples of successful businesses producing high value products from local resources.

7.4. Supply chain intergration – the case of MH MassivHolz (Austria)

MH MassivHolz is a collaborative producer network of small Austrian sawmills. The product focus is on high-end customer-finished sawn products and delivery services for small professional and private builders. Customer focus is on self-procuring

builder-owners, small manufacturers of builders' joinery and carpentry and architects as professional users of high quality structural lumber in timber construction.

The value provided to customers is based on low risk products in the sense that product quality is certified and audited by public and proprietary standards (ÖNORM, MH Massivholz product label). The products are decay resistant without chemical treatment. The products are machine strength graded and precut into customer lengths. The products are shipped JiT to the construction site. Horizontal collaboration creates value for the producers through outsourcing of marketing functions, capacity management and the price premium paid for the product label. The resource base consists of local, chain-of-custody certified timber. Only large-sized mature softwood and hardwood sawlogs are used. There is no sweep, no reaction wood or insect damage allowed.

The product strategy is based on low-risk native products with a high degree of prefabrication, additional services and the ability to respond to special customer needs. Vertical integration with respect to industrial and end users (forward) and the timber supply chain (backward) is an essential means to create customer value. By forward integration the operations in manufacturing and logistics are expanded towards the industry/customers that use the producer network's products. By backward integration the availability of the certified timber attributes is assured. Process integration means offering kiln-dried, canted, surfaced, planed, cut-into-final-length instead of rough-cut green products. Logistical integration offers the possibility to the customer to outsource supporting activities in its value chain to the producer network, for instance order allocation to the manufacturing mill offering idle capacity and services in transport, storage and quality control.

7.5. Supply chain integration – removing barriers to entry: Market development of Sitka spruce in the UK

Over 90 % of the UK's industrial wood production comes from coniferous plantations. Sitka spruce (*Picea sitchensis*) is the leading species accounting for 40 % of the harvest. Over the next 20 years spruce production will increase by 50 % as the country's plantation forests mature. Sitka spruce is native to the western seaboard of North America from southern Alaska to northern California. It has been Britain's leading plantation species because it is readily established, grows well, withstands exposure, is generally disease resistant and gives a higher yield than most other species, particularly on less fertile sites. Annual increments range from 6m³/ha/a to

26m³/ha/a, averaging 13m³/ha/a. It grows best in high rainfall upland areas in south and west Scotland, northern England and Wales. Supplies are sometimes mixed with Norway spruce (*Picea abies*). In comparison with spruce imported from northern Europe, British grown spruce is less dense (averaging 390 kg/m³) and generally of lower strength. Its texture is relatively coarse and it often has broad bands of early wood. This creates difficulties in machining the timber to comparable standards of finish to imported spruce. Distortion during kiln drying can also be a problem. However it has excellent properties for mechanical pulping and for chipboard and MDF manufacture.

Until the 1980's its main uses were in pallets, packaging, fencing products, sheds and agricultural buildings. However during the 1980's the expanding production of spruce sawn timber began to outstrip the capacity of these traditional markets to absorb the increasing supplies and the industry realized it had to move into new markets. The construction market was the obvious one to target, because it is by far the largest end user of sawn softwoods taking 70 % of annual consumption. In the 1980's virtually the whole market was supplied from imports. The barriers to market entry for British grown spruce were both technical and commercial. Technical barriers related to its low density, its strength variability, distortion in drying and the poor dimensional accuracy of timber from many sawmills. Commercial barriers included unfamiliarity by sawmillers with the construction industry's needs (sizes, moisture contents, timber grades, working practices); absence by British sawmillers from the supply chain to the construction industry (mainly through softwood importers and merchants); and finally a reluctance by the construction sector to use British timber because of its perceived shortcomings.

This situation necessitated coordinated action aimed at removing these barriers to market entry. The main organizations involved have been the Forestry Commission (the state forest service), building and timber research organizations, universities and the sawmilling industry itself. Key activities have been:

- Research to characterize the physical and mechanical properties of spruce grown under different silvicultural regimes and from different progenies
- Inclusion of British spruce (and other timbers) in construction codes; Sitka spruce is now strength graded for structural use in conformity with harmonized EN standards and CE marking regulations for European markets

- Research into improved methods of kiln drying and high temperature drying to prevent distortion
- Improvements in preservative treatments
- Development of finger jointing for construction uses
- Investment by the industry in modern sawmilling equipment designed to produce dried and strength graded timber for structural uses
- Development by sawmillers of supply chains to the construction industry
- Promotion of British grown timber to the construction industry, architects and specifiers
- Forward integration by some sawmilling companies into the construction industry, particularly in timber framed housing.

These and other actions have brought about a steady growth in use of British spruce and other softwoods in construction. In 2004 roughly 800 000 m³, or one third of the sawmilling industry's sales were to these uses and British timber has now gained a 10 % share of the market. The positive results from this sector wide collaboration have encouraged increased research and development work to strengthen the position of British grown spruce in the construction market.

8. MARKET ENTRY BARRIERS FOR MODERN TIMBER FRAME SOLUTIONS

8.1. Regulatory requirements

A study devised and designed by the EU Enhanced Use of Wood Working Group (EUW WG) concluded that overall, there are no direct regulatory barriers to timber frame in residential construction throughout Europe (Bregulla et al. 2003). Regulatory requirements are functional and may be considered equal for all materials. The main regulatory limitations are perceived to be fire and acoustic performance, particularly in multi-storey / multi-occupancy dwellings. For instance in the UK timber frame meets all current building regulations. The UKTFA Quality Assurance Scheme complies with EN 45011, integrates with ISO 9000, ISO 14001 and wood chain-of-custody certification and provides access to CE marking. The main recommendation to policy makers of the study is to ensure that the harmonization process proceeds on EU level and to safeguard that harmonization does not adversely affect the use of timber.

Box 3. Barriers to the enhanced use of wood in Europe – a comment

The barriers to the enhanced use of wood in Europe are identified and evaluated in a study prepared and reported by BRE as a part of the CEI-Bois Roadmap 2010 programme (Bregulla et al. 2003). The major focus of the study was on regulatory barriers and only briefly treated also other barriers, which were categorized into institutional, technical and economical. The main findings on these other barriers is a ranking list of issues compiled of information from a questionnaire sent to experts in 24 European countries, sectoral organizations as well as a network of professional experts and specialists. The study confirms the existence of barriers related to networking, the technical construction process and the supply chain. These barriers, however, were not perceived by the interviewees to be of top priority. This is a surprising conclusion remembering how these issues are rated for example in the UK construction industry's strategic vision about the key areas of competitive advantage (the Egan principles). In Finland, anyway, these barriers are given much attention as issues of very high priority.

8.2. Acceptability and quality perception of MMC timber frame among property valuers, lenders and insurers in the UK

There are more than 150 residential mortgage lenders in the UK. Since the 1980s the long-established building societies have been joined as lenders by banks and centralized lenders. Home buyers who need a mortgage can choose from a wide variety of mortgage packages. All mortgage lenders require a valuation when lending on residential property. Halifax estate agency is the largest and best-known estate agent in the UK, which provides valuation and surveying service for both mortgage lenders and private clients. Halifax does not make any differentiation in the lending terms offered for timber frame housing. According to Patrick Sawdon (2006), Head of Professional Services, properly constructed timber frame housing with a suitable external cladding is as good as housing which is built in brick or block. According to Tony Armstrong (2006), Director of Corporate Relations at Northern Rock, as a lender they do not differentiate between timber frame and any other standard form of construction. Northern Rock is among the 10 largest publicly quoted banks in the UK and one of the most successful mortgage lenders.

Phillip Roberts, Deputy CEO of Grwp Gwalia Cyf, a leading social housing developer in South- and Mid-Wales, agrees that "there has never been any difficulty in getting valuations or mortgages on any of our properties. ... Zurich Insurance actually prefers timber frame structures to other methods of construction" (Roberts

2004, cit. 2006). According to Bryan Woodley (2006) at UKTFA MMC Timber Frame is “largely” accepted by lenders and insurers. Timber frame homes tend to have fewer defects than brick and block homes and generate fewer complaints to the NHBC. The National Housebuilding Council is the UK’s leading warranty and insurance provider for new and newly converted homes. According to Steve Birt (2006) at the Association of British Insurers, insurance companies generally draw no distinction between modern timber frame and brick and block construction, provided that the external roof covering is also of tiles, natural or mineral slates or concrete.

8.3. Other technical and economic market entry barriers

Although there exist no proper regulatory barriers, the product standards and building systems applied in brick and concrete-based technologies by the construction industry and the absence of a standardized building system for timber construction have turned out to be a limitation for wood products to enter BtoB construction markets (a description of the concept is in Chapter 1). Modern timber frame construction systems are non-traditional building systems in Europe without an industrial tradition and legacy of proof. New building techniques such as off-site manufactured timber frame are reflecting different ways of constructing dwellings and therefore have associated with them perceived risk (Hewlett 2005). In Finland, concrete building construction turn-key contracting is offered by integrated suppliers. In the market for timber frame building systems turn-key contracting is offered by most suppliers for commissioned single-family home building. Timber frame system suppliers, however, are reluctant to enter BtoB markets under developer-led contracts.

9. INNOVATION IN TIMBER FRAME CONSTRUCTION AS RELATED TO THE WOOD PRODUCTS SUPPLY CHAIN

9.1. Business opportunities for timber frame solutions

In Europe there is a growing market for timber frame solutions which benefit from economic and legislative development. Technical and commercial issues do not restrict the use of timber frame solutions. Timber frame is cost competitive, at least compared to brick and block construction (National Audit Office 2005). The existing architectural and technical solutions are satisfying housing standards and building regulations (Bregulla et al. 2003, Grantham and Enjily 2003). Timber frame is largely accepted by mortgage lenders. Insurance companies draw no distinction between

modern timber frame and brick and block construction. Surveys have shown that residents of timber frame houses are satisfied with the functionality and the safety of their homes (Karjalainen 2002).

9.2. The need for innovation in timber frame construction and related supply chain management

Process re-engineering

In BtoB markets timber frame housing construction has to adapt to mainstream best practices in construction and supply chain management or better - as an entrant to the housing market - to outperform its competitors. This requires – besides offering outperforming products - being on the forefront in adopting best practices in the construction process and in the management of related supply chains initiated and implemented by the construction industry. The European construction industries are presently in a state of re-engineering their business processes on the strategic and operational level (Construction Task Force 1998, The Finnish construction industry's technology strategy 2002, Teriö et al. 2005). This responds to the rapid growth and structural changes in the demand for housing and new requirements in terms of cost, quality and environmental performance.

Rethinking construction, UK

In the UK, government initiatives and a large market demand backlog for housing (especially social housing) have led to rapid growth in the construction industry's demand for off-site prefabricated timber frame systems and structural components. For social housing providers strategic public private partnerships in the construction supply chain are a recommended means to “show continued improvement in the efficiency, effectiveness, economy and quality of their service provision” (Construction Task Force 1998). At the same time the UK construction industry in its efforts to improve performance in terms of cost and quality, in social as well as in private housing projects, is restructuring product delivery processes. In accordance with the Egan principles, processes are to be renewed by the industry around the four key elements of product development, project implementation, partnering the supply chain and production of components.

In its report to DPM John Prescott on the scope for improving the quality and efficiency of UK construction the Construction Work Force concludes that supply chain arrangements are crucial in all respects (Construction Task Force 1998). Supplier

selection and collaboration are admitted to be most important to give incentives for suppliers to improve performance in production and delivery of components and to capture their innovativeness for product and process development. Accordingly long-term partnering based on measurement of performance and sustained improvements in quality and efficiency must replace suppliers' project-by-project competitive tendering.

New market in low-rise high-density housing, Finland

In Finland changes in customer preferences account for a prospective change in the structure of housing demand characterized by a shift from medium-rise apartment houses towards low-rise detached and terraced houses. This change is expected to open up new markets for timber frame solutions. At the same time the share of developer-led professional construction will increase at the expense of self-procuring private builders. The government supports developing high-density neighbourhoods with their concomitant social and environmental cost savings. PPP procurement schemes shall contribute to reducing public funding requirements and speed-up the supply of serviced building land. New-builds on low-rise undeveloped sites (greenfield) and small-scale urban "infills" (brownfield) require different solutions. The challenges for timber frame construction lie in the development of design, production and logistical networks of developers as lead companies and SMEs as partners of their supplier networks and in organizational innovations addressing the complexity of urban housing construction projects.

Supply chain integration – integrating the wood products supply chain into the construction value chain

Entering new markets for timber applications and timber frame systems requires (i) the adoption of industrialized manufacturing methods (scale economies), (ii) supply chain integration to improve supply chain performance (supplier-supplier relationship), (iii) forward integration into the construction value chain (customer-supplier relationship, integration into contractor work teams and processes) and (iv) adopting best practices concerning building systems and procurement schemes such as Design & Build and PPP. Under PPP procurement agreements supply chain partnering may extend to the operation and maintenance of facilities.

In order to offer integrated construction packages to their clients, manufacturers of timber frame houses and the suppliers of subsystems and components have to collaborate with downstream installers and trade specialists as well as upstream

intermediaries and specialist material suppliers. Here also raw material suppliers or sawmills may have an important role. Integrated timber frame housebuilding supply chains may embrace upstream supply chain activities, i.e. manufacturer-subcontractor partnerships, manufacturer-intermediary partnerships as well as first tier partnerships with an assembly company and second tier subordinate component supplier relationships. Strategic partnerships with large customers might open-up opportunities for sawmills to reposition themselves from commodity markets into speciality markets. An example for the latter is the collaboration between the UPM Kotka sawmill (Finland) and Wimmer Holzwerke (Germany), a producer of structural glulam products, or the joint venture of a Canadian timber frame housing manufacturer and British sawmills as suppliers of floor systems and roof trusses (see Chapter 10).

Product and process innovation

In terms of product and process development, entering new markets will require the development of new products and related core design concepts; for instance in the design of wooden floor systems. But especially it requires a reconfiguration of the product system and its components and related work processes in the way components (parts and subassemblies) that are defined by their specific functions are designed and linked together. Concepts here are prefabrication, off-site manufacturing systems (OSM) and modern methods of construction (MMC).

9.3. Barriers to innovation

Knowledge base

The building sector is the predominant environment for the implementation of wood applications. Architects, construction engineers, developers and builders can refer to a common knowledge base of non-timber mainstream construction technologies and standards which in Europe with few exceptions is usually concrete or brick. The standards applied in mainstream construction technologies determine the conditions for product and process innovations in timber frame construction (Goverse et al. 2001).

Organisational change in production networks

Buildings are highly complex products. Technical change in building construction implies socio-economic change in the sense that changes in the relationship between firms dealing with a newly developed technology are often necessary (Goverse et al. 2001, OECD 1999). In building construction the network does not only comprise the

construction products' production system, but also the building design and on-site construction processes. For different procurement schedules networks may extend over the life cycle of the building.

Box 4. Radicality and complexity of innovation

Product innovations are categorized with respect to their technological radicality and organizational complexity (required network change) (Henderson & Clark 1990). The first dimension is defined as to which extent skills and expertise of organizations need to be adjusted to apply the new technology. The second dimension concerns the change in the structure of the production network – the supply chain – around an innovation. The rating of an innovation with respect to its socio-economic impact is *a priori* independent of how it is to be rated technologically. A radical innovation may be modular and therefore minor with respect to its socio-economic impact on network relationships. Timber frame OSM building systems substituting for traditional construction technology can be regarded as an innovation that requires the reconfiguration of an established system to link existing components together in a new way.

Technical radicality of innovation

Modern timber frame building techniques came from Scandinavia and North America (balloon-frame, platform-frame, panel system), although there are long traditions of massive wood construction also in Russia, the Baltic States and Central Europe. Shifting towards timber frame buildings may be categorized as a radical innovation in many countries, because of the totally different character of the technique, the building process and the specific sensitivities of the method. The building sector in many European countries has practically no experience with designing timber frame houses, methods of process planning, construction calculation, and the required craftsmanship and skills, although historical timber construction as a basis is present in many parts of Europe.

Tendering practice

Design-bid-build is the traditional project delivery approach that was used for most of the 20th century to procure public works. The design-bid-build model segregates design and construction responsibilities by awarding them to an independent private engineer and a separate private contractor. Construction work is subcontracted by work and trade.

Clients select designers and constructors separately on the basis of lowest cost by competitive tendering. Applying price performance as the selection criteria and

tendering practices does not provide incentives for innovation. Traditional construction project delivery typically is fragmented into a large number of construction works and material deliveries. The contractual relations are complex and occasional which does not allow appropriation of the full benefit accruing from learning by repetition. Contracts are to provide legal protection and to limit liabilities to recourse. Liabilities are marked-off by works and professions and do not conform to buildings' actual functional and productional entities (Lahdenperä 1995).

Box 5. EU revised public procurement tendering procedures to foster innovation

The Directive 2004/18/EC modernises the existing EU rules for public procurement. More flexibility will be provided to public purchasers to decide about the tendering procedure to be applied. It will be easier for authorities calling for tenders to apply the dialogue tendering procedure without being asked for a detailed briefing. It is hoped that it will become easier then for candidates to submit tenders that reflect the diversity of technical and innovative solutions. It is anticipated that contracting authorities specifying their requirements in terms of functional performance instead of technical specifications will support innovative solutions. Contracting authorities describe the minimum requirements to be met and authorize applicants to present more advanced technical and economic solutions.

The role of contractors and material suppliers

In the traditional project delivery mode the construction work of a pre-designed building is commissioned by the client to contractors on the basis of a technical “blueprint” prescription. The pre-design of the building and the prescription of its technical details set limits for the material supplier to develop new technical solutions, construction products or services.

Box 6. Traditional and turn-key project delivery approach

The design-bid-build model segregates design and construction responsibilities by awarding them to an independent private engineer and a separate private contractor. The design-build or turn-key procurement scheme is a project delivery method in construction contracting which combines architectural and engineering design services with construction performance under one contract agreement. With design-build (turn-key) procurements, owners execute a single, fixed-fee contract for architectural, engineering services and construction. The design-build entity may be a single firm, a consortium, a joint venture or another organization assembled for a particular project.

10. THE DEVELOPMENT OF MODERN METHODS OF CONSTRUCTION AND TIMBER FRAMED HOUSING IN THE UK

10.1. Introduction

The UK timber framed housing industry is an example of innovation in new products and markets by mainly small and medium-sized enterprises of the wood products value chain and business integration of wood products SMEs into the construction industry supply chain.

The growth in use of modern methods of construction (MMC) in the UK since the mid 1990s provides interesting examples of product and management innovation which have had a major impact on the British timber industry. Timber framed housing (TFH) has played a leading role in the growth of MMC and has been an important means by which the UK timber industry has integrated more closely with its biggest market; the construction industry. In the context of the COST Action E30, the growth of the industry is also a good example of the potential to strengthen links between urban demand for wood, in the form of timber framed housing, and rurally based forest industries, particularly sawmilling. The purpose of this chapter is to provide an overview of the development of timber framed housing in the UK and the reasons for its growth. It reviews:

- Some features of the UK housing market and related government policy, which have impacted on the TFH industry
- Competitive advantages of MMC over traditional construction methods
- TFH market development
- Main reasons for the success of TFH in the UK.

It further gives an example for integrating local sawmilling into the TFH supply chain.

10.2. Housing markets and related government policy in the UK

Demand for housing in the UK has been increasing over time and will continue to grow in the future. The most important drivers are various demographic trends and rising personal incomes. Although the demand for housing has been increasing since the 1970s there has been a long-term downward trend in the supply of new houses for many reasons including:

- Planning constraints mainly related to the availability of land for development
- High interest rates which have dampened construction activity

- Reductions in government expenditure on social housing
- Government policies encouraging improvements in the existing housing stock rather than construction of new houses (Barker 2004).

These market imbalances have led to greater volatility in house prices since the 1980s. The growing trend towards owner occupation and away from rented housing has also contributed to market volatility. These cycles have created a difficult environment for businesses (through monetary policies designed to control the housing market) and for economic policy makers. The weak response of housing supply to demand changes has been one of the factors underlying the market instability and in some regions, most notably south east England, a persistent supply shortfall has developed. This has resulted in a long-term growth rate in real house prices of 2.5 % over the past 30 years (Barker 2004).

Government attention is now focused on policies, which will address these problems, in particular:

- Achieving improvements in the affordability of homes, particularly for first time buyers
- Attaining a more stable housing market with less price volatility
- Meeting the serious housing shortages in the high-pressure regions
- Achieving an adequate supply of publicly funded housing.

In addition to these housing aims the government regards the construction industry as a key player in meeting its environmental, energy and sustainability objectives. From an environmental perspective the government wishes to reduce absorption of greenfield building land and GHG emissions.

The construction sector is of major importance in meeting the UK's Kyoto targets on GHG reduction because about 50 % of GHG emissions relate to constructing, occupying and operating buildings. Finally the government aims to encourage more sustainable forms of construction and sustainable communities by setting increasingly exacting criteria on the environmental impact and sustainability of building development plans, building design and materials use.

One of the ways in which the construction industry is responding to these needs is to move increasingly to the use of industrialized housing systems or modern methods of construction. The government is actively encouraging this development through its housing policies.

10.3. Competitive advantages of MMC over traditional construction methods

There is broad consensus by the construction industry and the government about the objectives of modern methods of construction (MMC). The construction industry sees MMC as delivering better products and processes, which improves business efficiency, product quality, customer satisfaction, environmental performance and the predictability of delivery timescales. MMC are therefore not solely concerned with particular techniques of building but also management systems which aim to improve delivery and performance of construction (NAO 2005).

Implementation of MMC focuses primarily on building techniques and processes. The traditional form of house construction in the UK is the so called “brick and block” system, where materials are delivered to site and most of the elements of the building such as walls, floors, roofs, internal fittings, and services are put together on site. The term brick and block reflects the fact that most houses use bricks and different forms of mineral blocks for the building shell. In comparison with this traditional system, MMC involve more off-site prefabrication of building components.

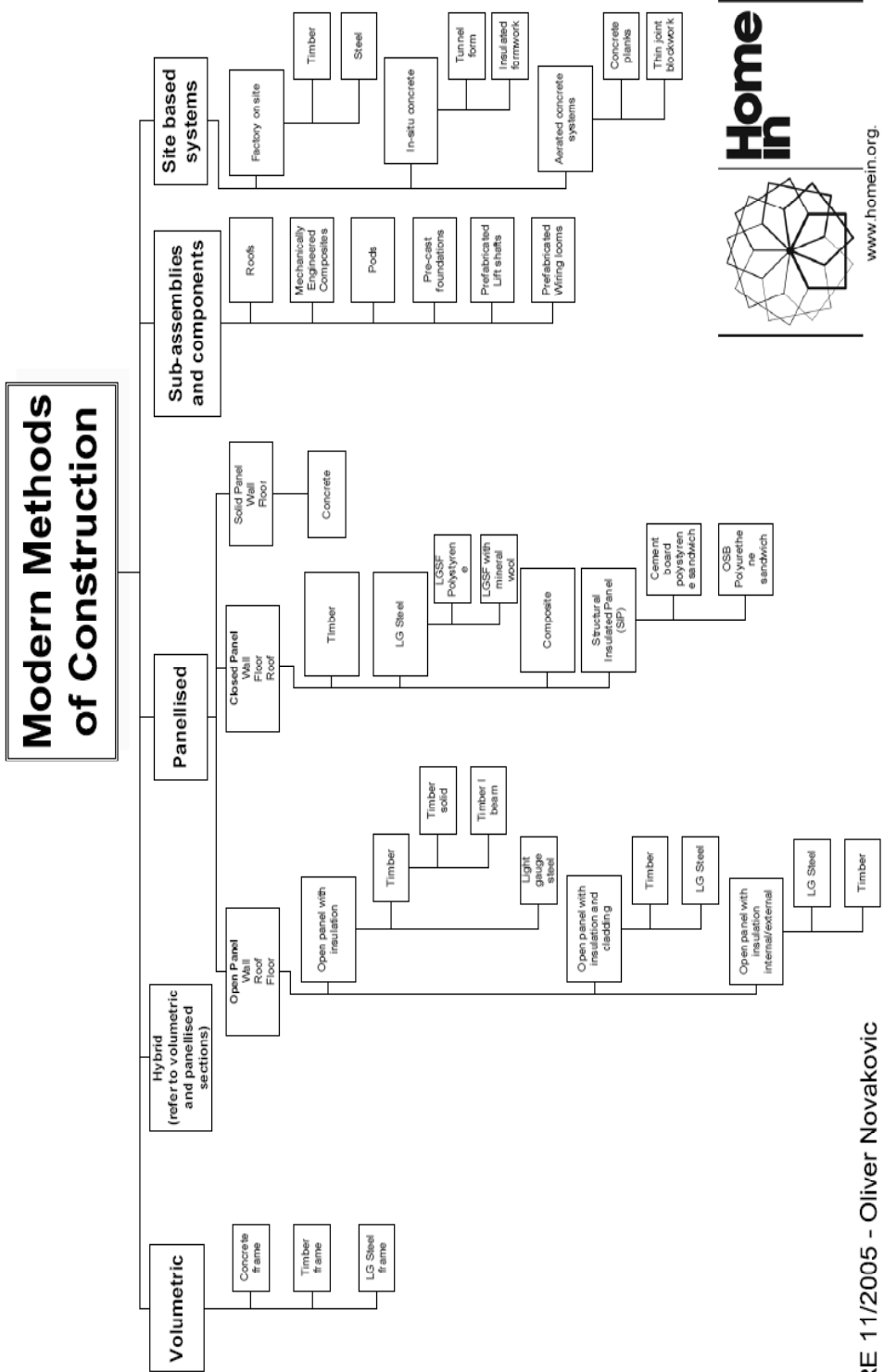
Box 7. Modern Methods of Construction

The main classifications of MMC are as follows (NAO 2005):

1. Volumetric construction. Three dimensional units are produced in a factory with all necessary internal fittings and services, and are brought to site complete.
2. Panelized systems. Flat panel wall units are manufactured in a factory and erected on site to produce a three-dimensional structure. Open panels consist of a skeletal structure only, whereas more advanced panels may include lining materials, insulation, services, windows, doors, internal wall finishes and external claddings.
3. Hybrid systems. These are a combination of volumetric and panelized systems. Volumetric units (“pods”) are used for highly serviced areas such as kitchens and bathrooms with the remainder of the building constructed using panels.
4. Subassemblies or components. Some parts of the house may be delivered to site as components. Examples are roof trusses, floor and roof cassettes.

Figure 13 defines MMC in more detail and emphasizes the fact that these systems may be timber, steel or concrete based or a mixture of different materials.

Figure 13. Modern methods of construction.



The main benefits claimed for MMC over conventional construction methods are (BRE 2006):

1. Labour savings, particularly on-site skilled labor
2. Time savings by faster completion of buildings
3. Cost savings and financial benefits
4. Quality improvements.

A recent report undertaken for the government by the National Audit Office has assessed these benefits and the key findings are as follows (NAO 2005):

Labor savings

- There are significant savings in on-site labour requirements and these vary according to the MMC techniques used.
- Greatest savings come from volumetric systems, followed by hybrid and then open panel systems requiring respectively 25 %, 70 % and 80 % of the on-site labour time of traditional systems.

Time savings

- On-site construction per completed house requires only 40 % of the time of traditional systems for volumetric, and 75 % for open panel and hybrid systems. Additional time savings result from using alternative claddings to bricks.
- Even greater time savings arise from achieving weather tight structures quickly, which in turn reduces weather damage to interior fixtures and allows interior work to be proceed without disruptions.

Costs and financial benefits

- Open panel systems cost approximately the same as brick and block but hybrid and volumetric systems tend to be more expensive.
- Cost advantages of MMC accrue where:
 - there are poor soil conditions favouring light weight buildings; this factor is often important on brown-field sites
 - there is restricted working space on site
 - buildings of three or more storeys are to be constructed
 - rooms in the roof space are required
 - alternative cladding materials and roof designs are acceptable.
- Financial benefits accrue from earlier completion and reduced on-site working including:

- earlier rental streams
- fewer snagging costs because of better quality control with factory made components
- need for fewer on-site inspections.

Environmental benefits

- MMC product systems have excellent energy saving features, which readily meet the new thermal insulation standards of the Building regulations (section L) introduced as part of the drive to meet Kyoto targets.
- Timber frame systems benefit from timber's environmental advantages, ie it is renewable, recyclable and when certified can be shown to come from sustainably managed forests.
- Wood products have low embodied energy compared with competitive materials.

Quality

- Durability (ie longevity) of the building is expected to be the same for MMC systems as traditional methods.
- MMC are considered to offer quality advantages because of easier quality control in factory based manufacture compared with on-site construction.
- Whole lifetime costs of MMC are judged to be not different from traditional systems.

The time advantages of MMC compared with traditional methods will only be realized, if there are effective working relationships between planners, developers, manufacturers of pre-fabricated buildings and building contractors. The planning and preconstruction phases of MMC are particularly critical activities compared with traditional methods (NAO 2005).

10.4. TFH market development

Timber framed housing (TFH) is currently the main form of MMC used in the UK housing industry and it has grown strongly over the past decade. The web site of the UK Timber Frame association provides up to date information of the industry's development. Key features of recent market development are as follows (Figures 14–17).

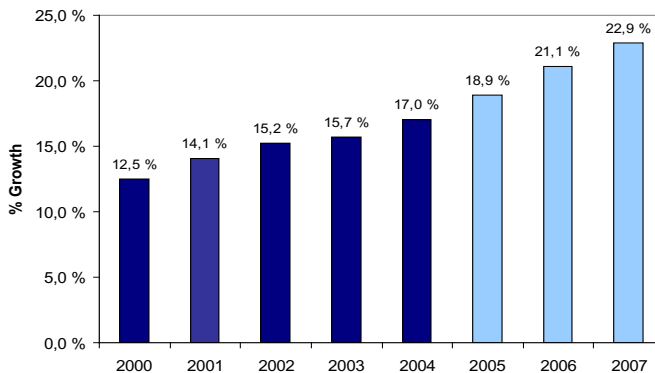


Figure 14. TFH market share 2000-2007 (UKTFA market report 2004).

- There has been a steady growth in the market share of TFH in new house construction. In 2004 17 % of UK new housing starts were timber frame construction compared with 12 % in 2000.
- TFH has gained a high share (55 %) of new social housing construction especially in high pressure areas.
- TFH in Scotland has a much higher market share (65 %) than in England and Wales (11 %).
- The industry forecasts continuing market growth over the next two years. By 2007 the total market share is expected to rise to 23 %.

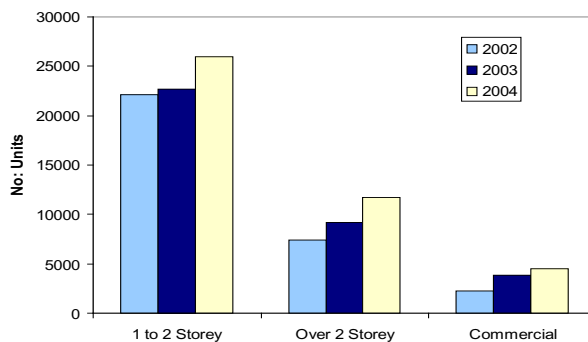


Figure 15. TFH production by housing type 2002-2004 (UKTFA market report 2004).

- A total of 42,000 TF units were produced in 2004, of which 62 % were of units of 1 or 2 storeys, 28 % were units of 3 storeys and over and 10 % were commercial buildings.
- The share of more than 3-storey dwellings is increasing.

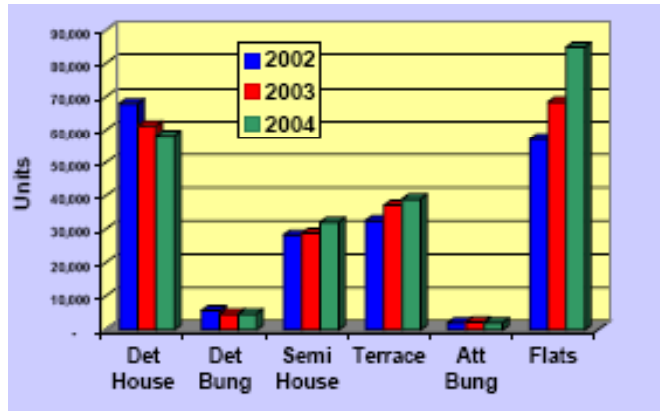


Figure 16. Total new housing production by housing type 2002-2004 (UKTFA market report 2004).

- Within the total new housing market the share of multi-storey units, usually flats (apartments), has been increasing, especially in areas of housing shortage. This reflects government policy of encouraging the supply of affordable housing, the scarcity of development land and the need for high density housing. TFH has increased its share of this growing market.

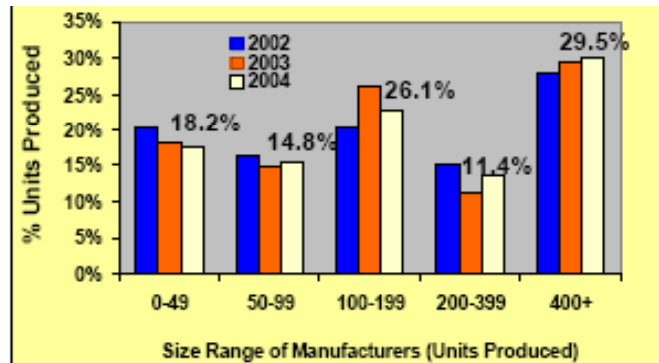


Figure 17. Shares (%) of TFH capacity by unit size, 2002-2004 (UKTFA market report 2004).

- The industry's production capacity has increased in line with market growth. In 2005 and 2006 several major manufacturers have invested in new capacity particularly in southern England. Larger manufacturers (producing over 400 units per annum) are slowly increasing their market share though smaller manufacturers still account for 70 % of the production.

10.5. Main reasons for the success of TFH in the UK

Marketing communication and information by promotion campaigns and education programmes have been one of the reasons for the successful expansion of TFH in the UK. The TFH industry has effectively promoted the technical, commercial and environmental strengths of TFH to major house developers, building contractors, public sector bodies and the government. This education and promotion has been undertaken by the timber industry acting jointly through the “Wood for Good” programme and by the main trade associations - the UK Timber Frame Association (the timber frame industry trade association), The Timber Trades Federation (representing imported timber traders and suppliers) and CONFOR (the association representing UK forest based industries). Individual timber frame manufacturers have also been very active in promoting timber frame construction and their own systems.

Another reason for the success of TFH in the UK has been that the TFH industry has integrated successfully into the construction supply chain. It has developed a detailed understanding of the needs and changing working practices of the construction sector and the industry’s key driving forces. As well as developing their own expertise in component manufacture TFH companies have established close working networks with developers and building contractors so they can jointly deliver complete housing developments. This requires collaboration on project design and planning, land acquisition, financing the development, product development, off-site component manufacturing and on-site building work.

10.6. Integrating local sawmilling into the TFH supply chain

Up to the present time TFH manufacturers have not been linked to British sawmills and have almost exclusively used imported sawn timber. However a major sawmiller has recently entered into a joint venture with a Canadian TFH manufacturer and will supply roof trusses and floor systems which, cannot be transported from Canada cost effectively. The same mill has also announced a move into the supply of acetylated timber, which imparts greater durability to softwoods. These products will be especially suited to cladding, windows and doors. There is likely to be growing integration of UK timber production, the timber framed house industry and the construction industry in the future.

11. PUBLIC PROGRAMMES AND PARTNERSHIPS IN SUPPORT OF NEW WOOD PRODUCT TECHNOLOGIES AND VALUE CHAINS IN FINLAND 1992-2006

11.1. Introduction

Both the innovation system approach and Porter's view of competitive advantage recognize the importance of the business environment for the innovation performance of a firm. Starting in the early 1990s a multitude of programmes have supported entrepreneurship and enterprise development in the timber frame construction value chain. The programmes were directed towards technological innovation and the establishment of expert networks related to timber frame construction. So far comparatively little support has been provided to develop new business concepts, new partnerships and value networks of SMEs in the timber frame construction value chain. There have been four major target areas: a) the development of new technologies and solutions, b) the promotion of business networking among rural SMEs, c) the formation of knowledge and expert networks for facilitators and executors in wood products business and d) the promotion of positive attitudes towards the use of wood and wood products.

11.2. New technologies

During the early 1990s public funding of industrial R&D activities was centralized and coordinated by the national Funding Agency for Technology and Innovation (TEKES). TEKES initially financed research and development projects in key business areas and value chains. The funding programmes have covered a) primary processing (sawmilling and wood panel manufacturing) and b) timber construction technology. The funding programmes were:

- The Mechanical Wood Processing (PMT) and Wood Based Panels (PLT) Industry Technology Programmes 1992-1996 (Klus and Hirvensalo 1997)
- The Wood in Construction Technology Programme 1995-1998 (TEKES 2000)
- The Value Added Wood Chain Programme 1998-2003 (TEKES 2004)
- The Construction Cluster Technology Programme 2003-2007 (TEKES SARA).

These programmes provided a) research funding for universities and research institutes yielding publically accessible results and b) public private research projects tailored to the needs of single companies with results available only to the companies involved.

The core mission of the **Wood in Construction Technology Programme** was to develop secondary wood processing, system providers, special contractors and new procurement practices. Thematically the programme covered timber frame construction technology, wood frame building systems, and multi-storey timber frame housing construction economics and reference projects. The programme comprised 138 projects, of which 81 were public-private projects.

The Value Added Wood Chain Programme focused on strategic research and development (35 % of funds), new products, services and internationalization (44 % of funds), and production and business processes (21 % of funds) in secondary wood processing. The fields of technology covered were sawn products, glulam products, timber frame components and production platforms, new log frame solutions, and the development of an open building system. The number of projects was 207, of which almost half were public private projects. The total outlay amounted to 52 million €.

11.3. Business networking

During 1992-1994 the first Wood Finland programme was established to support the establishment of wood products SMEs and their production networks in order to provide new employment in rural areas. In 5 cases different forms of collaboration (joint stock, cooperatives) were achieved. The majority of joint interest business networks, however, failed and only one large partner firm in wood furniture subcontracting has since continued. The second stage of Wood Finland was launched in 1998 parallel with the knowledge and expertise network PuuOske. Financing has been provided until 2007 for three subsequent programmes supporting building of business networks. The programmes deal with a) business concept formation for international markets and b) the promotion of network formation between wood products SMEs for domestic markets and lead firm export production networks for European markets, especially of those supporting new BtoB wood construction projects. Other activities were related to the formation of a business expert network with more than 70 experts in 18 regional network organisations.

11.4. Expert networks and promotion campaigns

Launched by a governmental initiative in the late 1990s regional networks of expertise were established for key industries. The major target was to build regional and national networks of expert organizations and firms using or being prepared to apply new

technologies. For the term 1999-2006 under the umbrella of the Centre of Expertise for Wood Products (PuuOske) a number of networks were established encompassing 55 actors involved in R&D in private companies, research institutes, universities and polytechnics. The coordination of the network activities was delegated to Wood Focus Finland and the Wood Finland network. The activities are focused on the following fields of expertise (network leader):

- Modern wooden neighborhoods and related timber frame construction (University of Oulu)
- Large scale wood engineering and structural systems (Tampere University of Technology)
- Living with wood and wood design (Helsinki University of Art & Design)
- New uses of wood (Finnish Forest Research Institute)
- New business concepts (University of Vaasa, Levon Institute)
- Business related technology development (University of Technology, Lappeenranta)
- Developer forum (University of Technology, Helsinki).

Promotion campaigns for the expanded use of wood were launched to support attitude formation, creation of wood construction expertise and the development of new craftsmanship and techniques (Wood Time 1997-2000), and to promote joint business formation activities in European markets (Wood Europe 2001-2005).

11.5. Timber frame construction development programmes forthcoming

Private business activities and R&D efforts have been directed towards BtoC housing construction markets. Although there is growing demand for urban timber frame housing in Finland to be expected in the future, nonetheless, in this market segment the industry is in an infancy stage and competitive supply is still to be created. The Finnish government has declared timber frame housing construction top priority in promoting the use of wood and rural development. For the term 2004-2010 two programmes with joint objectives were launched to promote knowledge and expertise creation in wood engineering and business management related to wood products and timber frame construction in order to reap the benefit from the environmental performance of wood products.

12. SUGGESTIONS FOR POLICY ACTION AND FURTHER RESEARCH²

12.1. Priorities for innovation and innovation policy in the basic wood products industries

As the competitiveness of concrete and steel structures is constantly enhanced, R&D activities targeting on product innovation in structural wood materials are essential to meet this challenge. For the basic wood products industries' process innovation as well as developing customer-supplier relationships and supply chain management will be of top priority in their innovation activities.

The typical pattern of innovation in these industries is incremental change. Developing process efficiency is of major importance to safeguard profits. Because of the competitive business environment, there are few incentives to set aside resources also for the development of completely new products and business areas. Technology diffusion is important in order to support the incremental development of key technologies and process technologies. The importance of diffusion for innovation suggests that focus should be on network-facilitating policies that connect industrial communities from the high-tech and low-tech industries.

With respect to external collaboration and knowledge diffusion the importance of gatekeepers is underlined in their role as intermediaries between scientific institutions and the more practical engineering heuristics (rules-of-thumb) that characterises the decision making routines of firms. The lack of immediate contact with the end user is seen as a general obstacle for development in the basic wood products industries. Innovation policy should be aware of the fact that collaboration and process integration with customers as well as material and equipment suppliers are important in the diffusion and adoption of innovative technologies.

Although the wood products industries are characterised by a mature technology, there nevertheless are 'pockets' (niche markets) of high technological opportunities. The industries' low R&D intensity and its risk-avoiding behaviour, however, make it difficult to explore these technological opportunities. The question is how to encourage firms to get committed to radical, science-based innovation and to apply new technologies. These low-tech industries, nonetheless, are not in a disadvantaged position with respect to public R&D compared to the high-tech industries. New entrepreneurship could be a means to explore technological opportunities; here a closer look could be given to possible entry barriers erected by industry incumbants.

² The author acknowledges that the authorship of the ideas formulated here lies to a large extent with the writers of the following publications: Kairi (2005), Palmberg (2001).

A challenge for innovation policy is the long time span from developing a new technology to developing a product into a marketable commodity and to integrating it into normal business activity.

12.2. SMEs in the wood products industries

The wood products industries are dominated by low value-added products. This product group is the domain of SMEs operating mainly in the domestic market. Small firms generally lack the competence to implement differentiation or focusing strategies. There is yet little collaboration between SMEs and the exporting industry.

There is also a lack of sub-product and component suppliers that could serve construction companies and drive product development according to perceived client needs. For small companies in the wood products industries to access markets for structural products and subsystem deliveries requires joining forces in collaborative supplier networks. Here policies should address bottlenecks in product innovation, marketing competencies and business resources as well as collaboration between large enterprises and SMEs and their integration into supplier networks.

Product policies focusing on customized, value added products impact on timber supply chain linkages with timber suppliers and forest operations. One question to be addressed here relates to market structures as a barrier to developing a product focused, selective and integrated wood procurement process.

12.3. Regulatory entry barriers to housing construction markets

There are no direct regulatory barriers to timber frame in residential construction throughout Europe. Timber frame meets all current building regulations. Varying practices across countries, nonetheless, complicate or fend off market access. Policy makers should ensure that the harmonization process proceeds on EU level. There are Eurocodes but their use is still limited. In PPP (Public Private Partnership) markets SMEs may suffer from a competitive disadvantage caused by bundling regulations, high bidding cost and pre-financing requirements. Joint tendering could help SMEs to avoid discrimination caused by bundling regulations.

12.4. Innovation systems

There are opinions from small businesses that have experienced a failure of government organizations to work collectively together as they have different or even

conflicting agendas as well as the lack of commitment to indigenous SMEs within key organizations of the innovation system. There has been a massive failure on the part of development agencies to nurture innovative SMEs. Risk-averse civil servants do not make good gatekeepers for this process. This is demonstrated by the many reports emerging from EU showing stagnation in innovation and entrepreneurship within the EU (Dauksta 2006, European Union Press Releases 2005a, cit. 2005b).

12.5. Supply chain integration

The success of modern timber frame housing construction in the UK markets is an impressive example for the role of supply chain integration between the wood processing industry and construction supply chain for gaining market access.

12.6. Suggestions for further research

The barriers to the enhanced use of wood in Europe were investigated in a study prepared and reported by BRE (2006). It addressed besides regulatory also other barriers, which were categorized into institutional, technical and economical. The study confirms the existence of barriers related to networking, the technical construction process and the supply chain. These issues can be assumed to be of high priority at least in some countries, as for instance Finland. To our knowledge there is nonetheless no study properly addressing the importance of these barriers at the European level.

REFERENCES

- Ansoff, H. I., 1957. Strategies for Diversification. *Harvard Business Review* 35(2):113-124.
- Armstrong, T., 2006. Interview, FAQ. Tony Armstrong, Director of Corporate Relations at Northern Rock, one of the largest UK quoted bank and a specialized mortgage lender. <http://www.northernrock.co.uk/>. Published at <http://www.benfieldatt.co.uk/>.
- Barker, K., 2004. Review of housing supply. Delivering stability: securing our future housing needs. Final Report and Recommendations. HM Treasury. HMSO. London. ISBN: 1-84532-010-7. 10 p. <http://search.treasury.gov.uk/>.
- Birt, S., 2006. Interview, FAQ. Steve Birt, Assistant manager at the Association of British Insurers, <http://www.abi.org.uk/>. Published at <http://www.timber-frame.org/>.
- BRE, 2006. The use of MMC set to sky rocket. In: *Constructing The Future. Magazine for BRE's customers. Issue 27.* 16 p. Building Research Establishment (BRE). Issue 27 - Winter 05/06 (Feb. 06). <http://www.bre.co.uk/ctf.jsp/>.
- Brege, S., Johansson, H.-E. and Pihlqvist, B., 2005. Wood manufacture, the innovative system that beats the system. *Vinnova Analysis VA 2005:01.* 74 p. <http://www.vinnova.se/>.

- Bregulla, J.R., Grantham, R., Johansson, H.-E. and Enjily, V., 2003. Barriers to the enhanced use of wood in Europe: Particular attention to the regulatory barriers. Report prepared by the Building Research Establishment (BRE) as a part of the "Roadmap 2010" programme of the European Confederation of Woodworking Industries, CEI-Bois. 19 p. <http://www.cei-bois.org/roadmap/reports.html/>.
- Breschi, S. and Malerba, F., 1997. Sectoral innovation systems: technological regimes, Schumpeterian dynamics, and spatial boundaries. Pp. 130-156 in: Edquist (ed.). Systems of Innovation: Technologies, Institutions and Organisations, Pinter Publishers, London and Washington.
- Building Europe, 2002. An Analysis of Building Systems and Wood Frame Housing's Opportunities in New Residential Construction in Selected European Countries. Report prepared for Nordic Timber Council September 2002 by HE Botstadsutveckling & Timwood AB. 73 p.
- Castellacci, F., Grodal, F.S., Mendonca, S. and Wibe, M., 2005. Advances and challenges in innovation studies. Forthcoming Journal of Economic Issues. 43 p. DRUID paper database <http://www.druid.dk/>. Conference papers summer 2004.
- Cohen, W. and Levinthal, D., 1989. Innovation and learning: The two faces of R&D. The economic journal 99:569-596.
- Cohen, W and Levinthal, D., 1990. Absorptive capacity: a new perspective on learning and innovation. Administrative Science Quarterly 35(1): 128-152.
- Construction Task Force, 1998. Rethinking Construction. The report of the Construction Task Force to the Deputy Prime Minister, John Prescott, on the scope for improving the quality and efficiency of UK construction. 37 p. Crown Copyright 1998 URN 03/951. <http://www.constructingexcellence.org.uk/>.
- Dauksta, D., 2006. Cefncoch, UK. Member COST E30 Group "Timber Frame Houses". Mr. Dauksta provided his assistance to the compilation of this report as a commentator, furthermore, he contributed with his valuable first hand experience as the owner and managing director of a sawmilling enterprise.
- Davis Langdon Consultancy, 2004. Timber Use for Construction in the UK. 118 p.
- Douma, S. and Schreuder, H., 2002. Economic Approaches to Organisations. Third edition. 282 p. Prentice Hall.
- Edquist, C., 1999. Innovation Policy – A Systemic Approach. Paper for DRUID's Innovation Systems Conference, June 1999. 18 p. DRUID paper database <http://www.druid.dk/>. Conference papers summer 1999.
- Enroth, R-R., 1995. Markkinointi pienyrittäjän näkökulmasta. Teoksessa: Mäkinen, P. and Selby, A. (toim.). Metsä- ja puualan pienyrittäjät. Metsäntutkimuslaitoksen tiedonantoja 555: 35-38. (Marketing in a small entrepreneur's point of view. In: Mäkinen, P. and Selby, A. (eds.). Small enterprises in the forest and timber industry. Research reports of the Finnish Forest Research Institute 555: 35-38.) In Finnish.
- European Union Press Releases, 2005a. An Action Plan to boost research. MEMO/05/366 12/10/2005. <http://europa.eu.int/>, Gateway to the European Union, Press Releases.
- European Union Press Releases, 2005b. Why Europe needs research spending. MEMO/05/199 09/06/2005. <http://europa.eu.int/>, Gateway to the European Union, Press Releases.

- Fagerberg, F., 2004. What do we know about innovation? Lessons from the TEARI project. Centre for Technology, Innovation and Culture, University of Oslo. TEARI project. Report No. 1 (2. Draft, September 20, 2004). 12 p.
- Finnvera, 2003. Toimiala-analyysi maakuntien puutuoteteoimialan tilasta ja sen maakunnallisesta merkityksestä. Päivitys 2003. (Sectoral analysis on the wood products industries' state and position in the regional economy. Update 2003. Finnvera, Finland's Export Credit Agency.) 34 p. In Finnish.
- Foss, N.J. (ed.), 1997. Resources, firms and strategies – A reader in the resource-based perspective, Oxford University Press. 382 p. Questia Online Library of Books. <http://www.questia.com/>.
- Goverse, T., Hekkert, M.P., Groenewegen, P., Worrell, E. and Smits, R.E.H.M., 2001. Wood innovation in the residential construction sector; opportunities and constraints. *Resources, Conservation and Recycling* 34:53-74.
- Grantham, R. and Enjily, V., 2003. Multi-storey timber frame buildings. A design guide. Results of the TF2000 project. 47 p. The Building Research Establishment (BRE).
- Harrigan, K. and Porter, M., 1983. End-game strategies for declining industries. *Harvard Business Review*, 61(4): 111-120.
- Hazley, C.J., 2000. Forest-based and Related Industries of the European Union – Industrial Districts, Clusters and Agglomerations. 427 p. The Research Institute of the Finnish Economy, ETLA. Series B 160.
- Henderson, R.M. and Clark, K.B., 1990. Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms. In: *Managing strategic innovation and change: A collection of readings*. Tushman, M.L. and Anderson, P. (eds.) 2004, pp. 92-107. Second edition. New York and Oxford: Oxford University Press.
- Hewlett, P.C., 2005. The Approval Regime. The contribution of Modern Methods of Certification. Paper by Professor Peter C. Hewlett, Chief Executive, British Board of Agrément presented February 11, 2005 at the Prime Conference, at the Institute of Directors in London, on Modern Methods of Construction. 16 p.
- Kairi, M., 2004. Lecture at the seminar “Enterprises, innovations and public policy related to the forestry-wood value added chain”, Joensuu, February 11-12, 2004.
- Kairi, M., 2005. Interaction of R&D and business development in the wood products industry, case Kerto laminated veneer lumber (LVL). Helsinki University of Technology, Department of Forest Products Technology. Laboratory of Wood Technology. Espoo 2005. Report 95. 237 p.
- Karjalainen, M., 2002. Suomalainen puukerrostalo puurakentamisen etulinjassa. (The Finnish multi-story timber apartment building as a pioneer in the development of timber construction) Department of Architecture, University of Oulu, Finland. 422 p. and appendices. URL: <http://herkules.oulu.fi/isbn9514266188/> Also available in printed format: *Acta Universitatis Ouluensis Technica C 166, 2002*. Oulu University Press. OULU 2002. In Finnish with an abstract and summary in English.
- Klevatorick, A., Levin, R., Nelson, R. and Winter, S., 1995. On the sources and interindustry differences in technological opportunities. *Research Policy* 24:185-205.
- Klus, J.P. and Hirvensalo, R., 1997. The Mechanical Wood Processing (PMT) and Wood-Based Panels (PLT) Technology Programmes 1992-1996. Evaluation

- report. 61 p. Technology Development Centre (TEKES), Finland. Technology Programme Report 7/97.
- Lahdenperä, P., 1995. Reorganizing the building process. The holistic approach. VTT Technical Research Centre of Finland. Publications 258. 210 p. and appendix.
- Lemola, T. and Palmberg, C., 1999. Innovations and industrial renewal in Finland - Back to basics in innovation studies. Paper prepared for the DRUID summer conference on Innovation Systems June 9-12 1999. 32 p. DRUID paper database <http://www.druid.dk/>, conference papers summer 1999.
- Levin, R.C., Klevorick, A.K., Nelson, R.R., Winter, S.G., Gilbert, R. and Griliches, Z., 1987. Appropriating the Returns from Industrial Research and Development. Brookings Papers on Economic Activity, Vol. 1987, No. 3, Special Issue On Microeconomics (1987), pp. 783-831.
- Malerba, F. and Orsenigo, L., 1997. Technological regimes and sectoral patterns of innovative activities. *Industrial and Corporate Change* 6(1):83-118.
- Malerba, F., 2002. Sectoral systems of innovation and production. *Research Policy* 31(2):247-264.
- Malerba, F., 2004. How and why innovation differs across sectors and industries. In: Fagerberg, J., Mowery, D.C. and Nelson, R.R. (eds.). *The Handbook of Innovation*. Oxford University Press.
- NAO (National Audit Office), 2005. Using modern methods of construction to build homes more quickly and efficiently. NAO Report. London. November 2005. 29 p.
- OECD, 1997. Oslo Manual: The measurement of scientific and technological activities. Proposed guidelines for collecting and interpreting technological innovation data. Organisation for Economic Co-operation and Development. Second version. 92 p.
- OECD, 1999. Boosting Innovation. The Cluster Approach. OECD Proceedings. 428 p. OECD Publishing 1999.
- Ollonqvist, P. and Rimmler, T., 2005. Process innovations in forestry – wood products value chains. Paper presented at the 3rd EFI PC Innoforce Meeting, May 31 2005, Vilnius, Lithuania. <http://www.efi-innoforce.org/> PC intranet, 12 p.
- Paajanen, T., Kotilahti, T. and Hirvensalo, R., 2004. Keski-Suomen puutuotealan toimialatyö, toteutus ja työn suuntaus. (Approaches of how to implement and where to direct the development of the wood industry in the region of Central Finland) Teknillinen korkeakoulu, Puunjalostustekniikan osasto, Puutekniikan laboratorio, Tiedonanto 92. (Helsinki University of Technology, Department of Forest Products Technology. Laboratory of Wood Technology, Working Paper 92.) 40 p. In Finnish.
- Palmberg, C., 2001. Sectoral patterns of innovation and competence requirements – A closer look at low-tech industries. Sitra, The Finnish National Fund for Research and Development, Reports series 8. 101 p. http://www.sitra.fi/en/Publications/search/publication_search.htm/.
- Penrose, E.T., 1995. *The Theory of the Growth of the Firm*. Third edition. Oxford and New York: Oxford University Press. 272 p.
- Porter, M., 1985. The value chain and competitive advantage. In: *Competitive Advantage: Creating and Sustaining Superior Performance*, pp. 33-61.
- Porter, M., 1990. *The Competitive Advantage of Nations*. The Free Press, New York ja Collier MacMillan, Toronto. 855 p.

- Praest, M., 1998. Processes of technological competence accumulation: A synthesis. Paper prepared for the DRUID summer conference, June 9-11, 1998 at Bornholm, Denmark. 25 p.
- The Finnish construction industry's technology strategy: Starting situation, focal points and implementation, 2002. The Finnish Construction Industry Association. (Rakennusteollisuuden teknologiastrategia: Lähtökohdat, painopisteet ja toimeenpano. Rakennusteollisuus RT ry.) 26 p. In Finnish.
- Roberts, P., 2004. The Use of Timber in housing in Wales and the UK. Lecture at the seminar "Enterprises, innovations and public policy related to the forestry-wood value added chain". February 11-12, 2004. Joensuu, Finland.
- Roberts, P., 2006. Interview by Dainis Dauksta, Wales Woodland Forum, Cefncoch, UK.
- Saarikivi, M. and Riihonen, S., 2003. Improving competitiveness and internationalization of the Finnish wood products industry in markets for garden and landscape structures. (Suomen puuteollisuuden kilpailukyvyyn parantaminen ja kansainvälistyminen piha- ja ympäristörakentamisessa). Helsinki School of Economics. Publications B49. 117 p. In Finnish.
- Sande, J.B., 2003. The Role of Vertical Integration in Explaining Sustained Superior Performance in the Forest and Paper Industry. Paper presented in a workshop on utilization of panel data in agriculture at the University of Helsinki, Faculty of Agriculture and Forestry, Department of Economics and Management, September 26, 2003. 36 p.
- Sawdon, P., 2006. Interview, FAQ. Patrick Sawdon, Head of Professional Services, Halifax Valuation and Surveying Services, UK. Published at: <http://www.timber-frame.org/>.
- Schienstock, G. and Hämäläinen, T., 2001. Transformation of the Finnish innovation system: A network approach. Sitra, The Finnish National Fund for Research and Development, Reports series 7. 246 p. http://www.sitra.fi/en/Publications/search/publication_search.htm/.
- Schuler, A., 2002. Innovative Uses of Wood Promotes Market Development and Supports Forest Sustainability. Lecture. UNECE Timber Committee sixtieth session, September 24-27, 2002, seminar: Innovative uses of wood, September 23-26, 2002. Neuchatel, Switzerland.
- Sturgeon, T.J., 2000. How Do We Define Value Chains and Production Networks? MIT IPC Globalization Working Paper. Background paper prepared for the Bellagio Value Chains Workshop, September 25 – October 1, 2000. 22 p.
- Teece, D., 1986. "Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy," *Research Policy*, 15(6):285-306.
- Teriö, O., Kauranen, H. and Mikkola, K., 2005. The re-engineering of densely build low-rise timber frame construction processes (Puurakentamisen prosessien re-engineering - PURRE). Report of a project co-financed by Wood Focus Finland and the Finnish Funding Agency for Technology and Innovation (TEKES). 55 p. In Finnish.
- The Finnish Timber Construction Development Programme 2004-2010: Task group suggestion (Puurakentamisen edistämisohjelma 2004-2010: Työryhmän ehdotus). Finnish Ministry for the Environment. Working Paper 147. Helsinki 2005. 84 p. In Finnish.

- Thommen, J-P. and Achleitner, A-K., 2001. **Business economics – A comprehensive introduction from a management point of view (Allgemeine Betriebswirtschaftslehre. Umfassende Einführung aus managementorientierter Sicht).** 1020 p. Third edition. Gabler Verlag. In German.
- TEKES, 2000. **Wood in Construction Technology Programme 1995-1998 (Puurakentaminen 1995-1998). Final and Evaluation report 12/2000.** Technology Development Centre (TEKES), Finland. 103 p. In Finnish with an English summary. <http://www.tekes.fi/english/programmes/woodconst/woodconst.html/>, <http://www.tekes.fi/julkaisut/Puurakentaminen.pdf/>.
- TEKES, 2004. **Value Added Wood Chain 1998-2003 (Tukista tuplasti 1998–2003).** Final report. Technology programme Report 9/2004. National Technology Agency (TEKES), Finland. 95 p. In Finnish and in English. http://websrv2.tekes.fi/opencms/opencms/OhjelmaPortaali/Paattyneet/Tukista_tuplasti/en/etusivu.html and http://www.tekes.fi/julkaisut/Tukista_tuplasti.pdf/.
- TEKES, SARA - Value networks in construction, 2003-2007. Technology programme. <http://akseli.tekes.fi/opencms/opencms/OhjelmaPortaali/ohjelmat/Sara/en/etusivu.html/>.
- Tushman, M.L. and Philip, A. (eds.), 2004. **Managing strategic innovation and change: A collection of readings.** 635 p. Second edition. New York and Oxford: Oxford University Press. UKTFA market report 2004. Facts and Figures. UK Timber Frame Association. <http://www.timber-frame.org/>.
- Woodley, B., 2006. Lecture. Brian Woodley is the Chief Executive UK Timber Frame Association. Available at: <http://www.timber-frame.org/>.

DELOCALISATION OF WOOD WORKING INDUSTRIES TO BALKAN COUNTRIES: ANALYSIS OF STATISTICAL DATA AND CASE STUDIES

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1. INTRODUCTION

The issue of internationalization and delocalisation of enterprises in various European Union (EU) and non EU countries has, in the recent years, grown in relevance and importance. The event by which many enterprises (not only in the furniture industries) have re-allocated over the national borders their productive units, is driven not only by economic forces, but also by social dynamics and strategic objectives (Marini 2005).

In this paper, the complex and heterogeneous question of internationalisation is analysed in a non orthodox way, by means of case studies from Italy and Romania. Another analysis on delocalisation/internationalisation of timber industries are presented by Ollonqvist et al. in this publication.

After a brief literature analysis and the introduction of the general concepts on the process of internationalisation, the present work focuses on the process of delocalisation which took place in Italy and Romania. For these countries a description of the official data on delocalisation is presented, following by a brief analysis on the internal political and socio-economic situation in these countries, such us policies implemented for promoting or attracting foreign direct investments (FDI), and perception of constraints and limits to delocalisation. Thereafter the general situation of the country with reference to the FDI is presented on the basis of statistical data and qualitative information. Eventually two case studies are presented: first referring to a large enterprise which has delocalised a production unit from Austria to Romania, the second regarding a more disperse delocalisation process which affected the whole area of eastern Veneto region, when several small enterprises in timber-furniture industrial districts started a process of delocalisation to some areas in Romania.

2. BACKGROUND AND MOTIVATION FOR DELOCALISATION

The meaning of delocalization or internationalisation is rapidly changing. The approach of geographical economy adopts some important assumptions: production

factors can, in modern organisation of markets, be mobile through delocalisation so that incomes and factor prices can be led endogenously (Grainville 2004).

However, it must be also recalled that not only many industrial groups, but also small enterprises, have reallocated their productive units over the national borders. This process has been driven not only by economic factors, but also by social dynamics and strategic objectives of the industries. Observing the phenomenon from the point of view of enterprises, strategies leading to delocalisation are generally related to markets, minimisation of costs and to a more general concept of globalisation.

Delocalisation is driven by the market when the decision to delocalise is determined by the size of the market and by its growth rate. In this case, delocalisation is considered (and also analysed) as a substitute for export. A typical example of this kind of delocalisation is the strong process of investments and positioning of companies providing immaterial services in EU candidate countries and new member states, including for examples banks and financial service.

Minimisation of costs is a typical aim for industrial companies. In this case, determinant factors for delocalisation can include labor costs, transportation costs and availability of skilled workers and at least in the first phases of delocalisation, production is mostly exported to developed markets.

Globalisation tend to impact on the long term strategy of companies, coupling or combining the previously described two reasons for delocalisation; i.e., the better market access and the minimisation of production costs. Affecting more to the long term strategy of a company, globalization generally applies first to large and multinational companies. During the last decade, however, also some small and medium size enterprises have been searching for better access to global markets, particularly in the fashion sector, but still rarely in the wood and furniture industries.

The process of internationalisation has during the last decades gone through different phases, as summarised in Table 1, shifting from internationalisation which regarded mainly large enterprises and multinational companies in the 1970s and 1980s to something that involved also small and medium sized enterprises from the late 1980s until today. In this evolution of internationalisation, beside the actors, also the areas of delocalisation, the sectors involved and the motivations for internationalisation have changed.

In the last phase for internationalisation, the firms more interested in internationalisation process have been small and medium sized and the drivers

for delocalisation process have included both; the market orientation and cost minimisation. The countries of destination have been chosen on the basis where potential markets are growing and cost of labour is particularly low. However, in the final decision on delocalisation, other factors, such as standards in pollution control, labour security, social security standards etc., have also been relevant, although often not explicitly reported.

Table 1. Stages in the process of internationalisation

| Stages | Main players | Areas of destination | Sectors involved | Main motivations | Forms |
|-----------------|------------------------------------|--|--------------------------------|---------------------------------------|---|
| Until the 1970s | Big groups Minor multinationals | Latin America European countries | Scale intensive | Market-oriented (tariff jumping) | Greenfields Joint-ventures Co-operative agreements |
| 1980-1988 | Big groups | European countries | Scale-intensive | Market-oriented Economies of scale | Acquisitions Joint-ventures Co-operative agreements |
| 1988-2003 | SMEs | European countries Europe Far East | Scale-intensive Traditional | Market oriented Cost savings | Acquisitions Joint-ventures Co-operative agreements |

Many enterprises and industrial groups have reallocated their production units over the national borders. This process has been driven not only by economic forces, but also by social dynamics and strategic objectives. The result is that the word 'internationalisation' indicates several meanings (foreign trade, FDI, outsourcing, subcontracting). Due to the fact that traditional statistical sources mainly refer to FDI, emphasis in this paper is given to FDI more than to other definitions.

Statistics on FDI at European level are published by several international agencies. OECD publishes a Yearbook on International Direct Investments, which contains, for all OECD Countries, data on inflows and outflows of FDI by country and sector, and inward and outward position for each country. Last report available is from year 2005 (OECD 2005).

Another source of data is Eurostat (Eurostat 2005) official statistics, here the data and information are updated to 2003, the area covered with the data is EU25, and the detail of the data is at country level. Type of information made available by Eurostat is quite similar to OECD: inflows/outflows and inward/outward position by country and sector. Eventually World Bank (World Bank 2005) periodically publishes

a report on the 'investments climate', specifically addressed to investors, containing information and general data on the economic and social state of each country.

Statistics illustrate that, as a consequence of EU enlargement a net increase of FDI in Europe occurred in the new member states. However, it is generally well known that the main flow of investments is concentrated to the period before the individual countries formally entranced to the EU. This is illustrated in Figure 1, where it is evident that the highest level of foreign investments in the ten new member states of EU took place between 2000 and 2001.

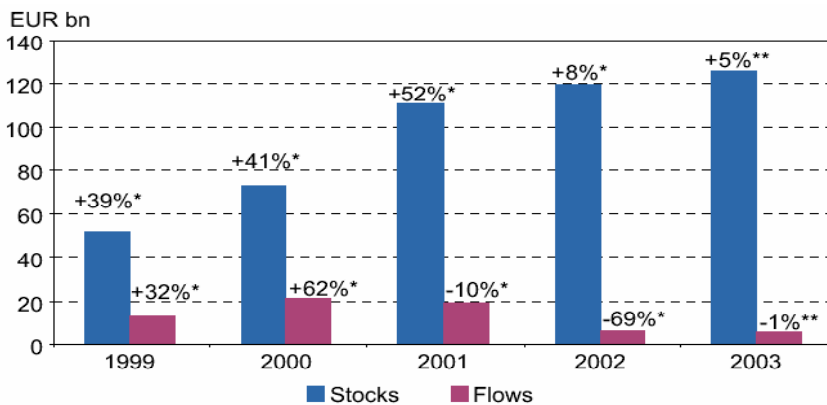


Figure 1. Flows and stocks of FDI in new EU member states.

The share of EU 15 FDI outward stocks in the new member states (Figure 2) shows that in the first stage of enlargement (15 to 25 member states) the most important countries in term of FDI, were Poland, Czech Republic and Hungary. Other countries, such as Baltic countries, Slovakia and Cyprus, were definitely less important.

2.1 Internationalisation and industrial districts

With reference to Italy and in particular to the North-East regions, the process of internationalisation is strictly related to the presence of a structured network of industrial districts (ID).

North East of Italy, including the two administrative regions of Veneto and Friuli Venezia Giulia and the autonomous Provinces of Trento and Bolzano, has proved in the last two to three decades to be one of the most dynamic areas of Italy, and, according to recent studies and statistics, of all Europe. A key sector of this development was,

and still is, the timber based industry, mainly furniture, furnishing, buildings, picture frames and so on.

It is of interest to note that until a few decades ago timber industry was considered to be obsolete, and therefore bound to decline in a more mature industrial system. Nevertheless growth has continued until the beginning of the current decade, when a certain crisis of the industrial structure occurred. However this recent crisis seems to be due more to the loss of competitiveness of the industrial sector as a whole, than to a specific negative performance of the wood and furniture sector in these regions.

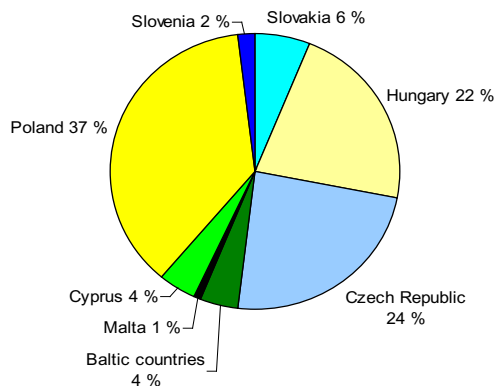


Figure 2. Shares of EU 15 FDI outward stocks in new member states (end 2002).

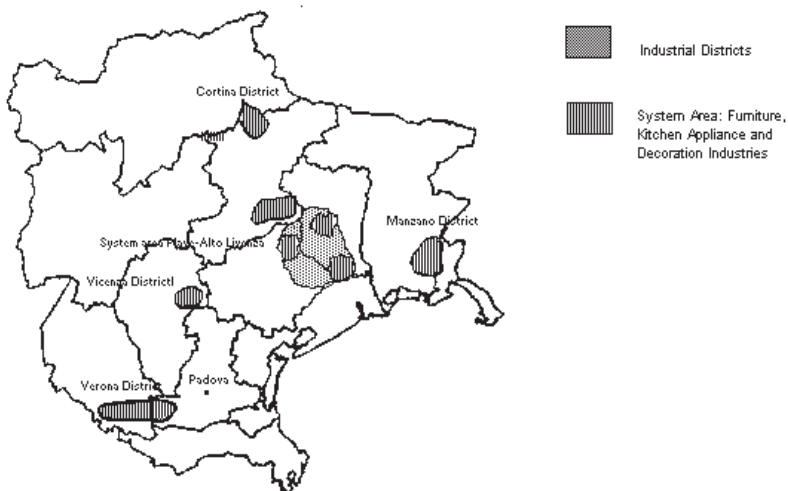


Figure 3. Timber based industrial districts in Venetian regions.

The industrial pattern of the north-east region of Italy is characterised by the so called 'late economic development' that has taken place during the last 30 years (Fuà 1980 and 1983, Garofoli 1983 and 1991). The industrial development is widespread and involves the entire land system from major cities to minor centres in rural areas. The key feature of this model, as opposed to the old industrialised regions of North West of Italy (so called industrial triangle among Milan, Turin and Genoa) is given by spontaneous network economies (Dei Ottati and Becattini 1987) of highly specialised and closely linked small factories, often developed from, and sometime still run, as family businesses. This pattern of development, rather peculiar, and often considered as typical of late economic development (Fuà 1980) is however far from being uniform.

The changing nature of these industrial systems is well recognised and different stages have been identified. There is a certain agreement upon three stages of development:

- *Local specialised centres* seem to represent the first stage of 'late economic development' patterns. Often these centres result from autonomous growth of existing, local, traditional craft business. However, sometime these centres are also result of decentralisation from more developed or structured industrial areas: In the first phase (1960-1970), to produce certain components or elements in the production chain, the existing overgrown factories which were lacking in flexibility and were located in structured and well developed industrial areas made contracts with small firms. The main driving force was in that period represented by the cheap labour available in the North-East and, sometime, the neutralisation of powerful trade unions which were particularly strong and active in big factories and old industrialized areas. It is very interesting to note that a similar phenomenon has occurred in the last ten years with the delocalisation from industrialized areas in Italy and other developed European countries towards eastern countries and China. The driving factor has been, and still is, the cost of labour together with a certain need of less controlled and constrained standard of production, particularly safety of labour and pollution regulation.
- *Industrial district* is generally indicated as second step in the 'late economic development'. Here integration of the small enterprise network becomes a key feature of the industrial development. In other words, the different individual units develop into a mutually related network. Specialised private

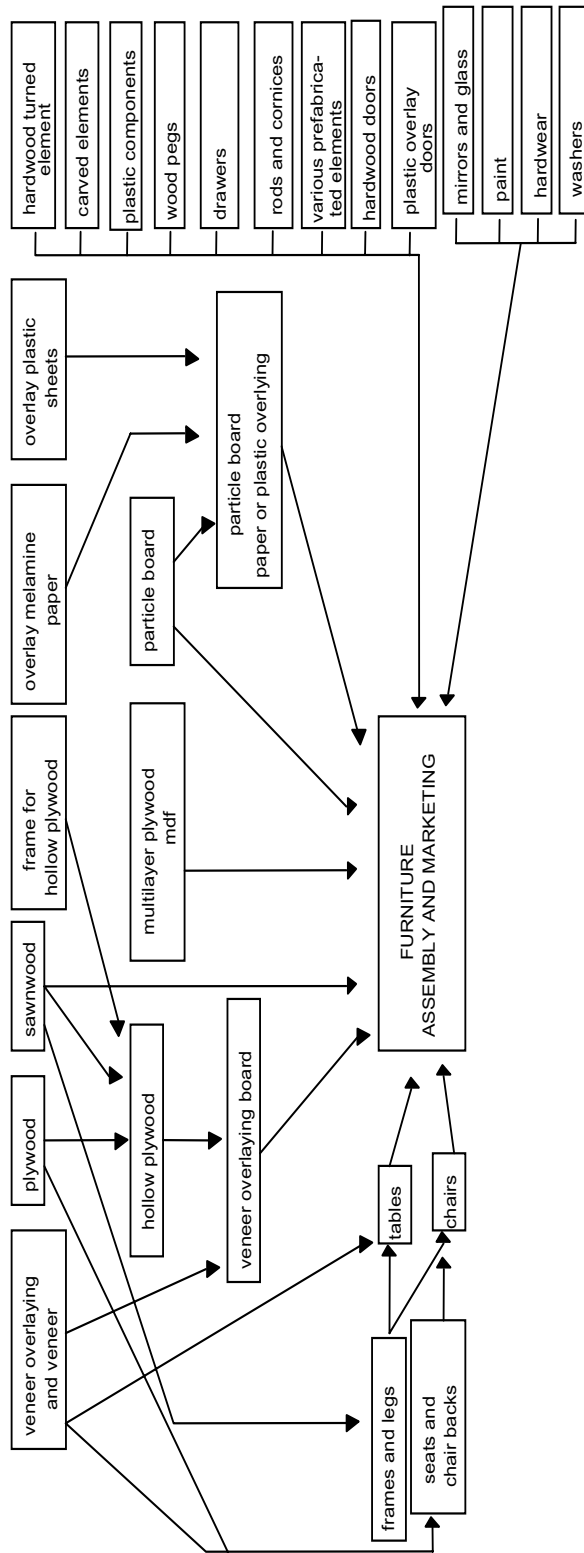
firms, consortia amongst producers and sometimes public structures like chambers of trade, provide services to the production units which are organised not only in the classical horizontal way, but often vertically, forming true 'inter-firm' production chain. This stage seems to be not yet developed in eastern countries and the main reason, from the point of view of the authors, is that many enterprises still maintain a strong connection with the country they come from. Many authors agree the idea that, at this stage, a sort of international district exists, where part of the production chain is still in developed countries and the less technological phases are delocalised in local specialised centres in eastern and less developed countries.

- *Systems areas* represent the most advanced step of the 'late economic development' pattern. At this stage the specialised industrial districts open up to other districts and to collateral industries and services, including the most advanced ones. Chains of inter-related, mutually integrated industries and districts, develop into systems areas – or clusters in Porter's (1989) terms. The specialisation characterizing industrial districts apparently diminishes. For instance furniture manufacturing can establish close contacts with kitchen appliance and decoration industries. In other cases factories appear producing machine tools for wood processing. Competition, at this stage, takes place in international markets. Sometimes multinationals take over the more promising factories.

Several studies are available on the process of delocalisation from industrial districts in Italy to eastern countries, both in Europe and out of Europe. Mariotti (2004) presents a study based on a set of interviews and a sample of entrepreneurs which have, in the last years, delocalised part of their industrial activities to the Balkan countries. The study concentrated on 180 leading enterprises located in industrial districts of central and northern Italy. Evidence from the research shows that almost all enterprises have external links abroad, such as contractors, and more than 50 % of enterprises use prime material brought abroad. Around 34 % of enterprises had one or more production unit abroad and 19 % of them had more than one production unit abroad. It is also interesting to note that districts where the process of internationalisation was more advanced were those specialised in furniture, mainly the chair district in Manzano.

Another interesting information published in the study (Mariotti 2004) regards the motivation which stimulated the delocalisation of production units. It was, in most cases,

Figure 4. Examples of a furniture industrial district and the related production chain (Merlo 1996).



represented by production cost (36 %) and labour availability/cost of labour (26 %). Only 22 % of the delocalisation processes were driven by the possible exploitation of the foreign market. In general terms, it can be said that in 60 % of the enterprises, the main reason which motivated the delocalisation process was represented by production cost, however, also incentives and tax exemptions were relevant in 26 % of cases.

Conclusions address that delocalisation in industrial districts is mainly stimulated by the wish to reduce production cost, particularly cost of labour, but also, in some cases, by the lack of labour supply in the present location. The exploitation of final foreign market plays also an important role in the location choice.

3. CASE STUDIES

The following two case studies analyse delocalisation from EU15 countries to Romania. The first case study summarises the results of a survey carried out in the summer 2005 on a sample of Italian entrepreneurs active in the wood and furniture sector in Romania. The second case study regards a large wood processing enterprise which, as a consequence of a deep restructuring process, delocalised all its production units to Romania.

3.1 Internationalisation of Italian industrial district - SME in Romania

Internationalisation strategies adopted by the Italian SMEs and industrial districts have changed over the past three decades. Studies have showed that once a company has internalised its capability to manage transnational production and the co-ordination involved, location of production and management over distance become less problematic for a company. The motivations of enterprises on delocalisation can evolve over time, for instance, from original cost-saving aims to more market-oriented aims or to the adoption of global strategies. District firms tend to delocalise all their production stages abroad while they keep product design, quality control, marketing and brand development in the original location and system (Mariotti 2004).

As regards the wood working sector in Italy, there are a number of industrial districts highly specialized in production of very differentiated goods (chairs in Udine province, classic style furniture in Bassano del Grappa area and Verona province, modern style furniture in Southern Padova province and Piave river area, kitchens in Pesaro province, etc.). Thanks to the high quality production of the industrial districts, since 1980s and 1990s, Italy has been one of the biggest producer and exporter (to

U.S.A, Japan and Western Europe) in the world furniture market, even though the country could not count on low labour costs or high stocks of raw materials.

In the past decades, the strong interconnection between the SMEs in the industrial districts has been the key to success from the global market competition point of view, limiting the internationalisation process only to the actions of market expansion through the export of final products. This has helped to postpone the necessity to delocalise any operative phases. At the most strategic markets, enterprises (also the SMEs in cooperation with others belonging to the same industrial district) have established showrooms and trade point in order to (Bresolin and Biscaro 2001):

- Better control the distribution abroad
- Easily get access to information on the market requests
- Observe quickly new market opportunities
- Develop and check market penetration plans more efficiently

Recently, the interest of many wood working companies has moved towards new and large potential markets in Russia and China, where, thanks to the fast growth of national economies, an increase in demand is expected. In those markets, the early presence is expected to offer competitive advantages. Today, Italian firms are more often than earlier present in the sector specific fairs organised in those countries.

In the last years, different production stages have been part of internationalisation processes. Large enterprises as well as SMEs belonging to industrial districts in Italy have decided to fully or partially move their production especially to the Eastern European countries through different ways.

For some SMEs specialized in the final part of the wood working process (production of furniture, for example) the tendency has been to establish, alone or through joint ventures, a complete new supply chain from raw material to the final particles. Low investment costs and other competitive advantages (labour cost among them), have motivated for the development.

At the Department of Land Use and Agroforestry Systems of the University of Padova, a research on the internationalisation process of the Italian wood working industry has been recently started. Till now, the collected data includes the investigation of 25 enterprises (10 small, 11 medium and 4 large enterprises), belonging to the wood-working and furniture sectors (Table 2).

Most of the studied enterprises (22) have been established through a joint venture between one or more major Italian shareholders, and at least one minor Romanian

member, required by the Romanian law on foreign capital investments. Some of the studied enterprises (7) have been operating for more than 10 years, some (10) have started their operation after year 2000. Rest of the companies are even younger than this, and their future planning is quite variable: some are planning to close the company and move back to Italy, some are planning new investment in Romania to enlarge their market-share.

More than half of the studied enterprises are typical examples of internationalisation of Italian enterprises belonged or still belonging to an Italian industrial district. Largest of the enterprises in terms of the number of employees and production capacity, is a joint venture between three SMEs of the same Italian industrial district. The three SMEs from the 'chair district' of Udine have invested and established a single large enterprise producing semi-finished wooden components in Romania for the chair, table and furniture production in Italy.

Table 2. Investigated firms classified by the type of product.

| Product | Number of companies | Employees | Volume (m ³ /year) |
|------------------------|---------------------|-----------|-------------------------------|
| Furniture | 5 | 100 | 1000 |
| Panels | 1 | 200 | 10000 |
| Parquet | 4 | 140 | 11450 |
| Semi-finished products | 11 | 100 | 10250 |
| Laminated beams | 1 | 50 | 35000 |
| Timber trade | 1 | 180 | n.c. |

It has been noted that in some cases, the investment in Romania is *de facto* an example of 'delocalisation' since the production stages, not any longer economically sustainable in Italy, have been totally transferred into another country. As a consequence of delocalisation, many semi-finished products are produced today in Romania and then send to Italy for their final working stages (smoothing, varnishing and assembling).

In general, most of the contacted firms aimed to gain from the competitive advantages of Romania (including low salaries, low cost and high availability of raw material, low electricity and gas prices, tax relieves, investment incentives, etc.) through establishing own wood supply and processing chains still lacking in the new

district context. Often an established new firm has become a supplier of semi-finished products to the parent SME in Italy.

It seems that in Romania, enterprises did not recreate similar integration of operations as in the traditional industrial districts in Italy. The new and more autonomous way of operation included a large number of different production stages (raw material supply, sawing, trimming, boards/panels/other massive or laminated semi-finished wooden products production). Sometimes the processing included also the final products (furniture, floors, doors and frames) to be sold in the growing markets in Romania.

Regarding the aspect of accessories and tools supply (nails, screws, handles) and packaging, the delocated companies often referred to the traditional suppliers in Italy rather than any Romanian supplier. This kind of attitude of the delocalising firms has produced different effects, not all positive, both in Romania and in the Italian industrial districts:

- In Italy some production phases have been closed or the amount of production has decreased with immediate consequences in unemployment
- In Romania, after a first phase of increasing profits due to evident competitive advantages (especially those linked to energy and raw materials costs and tax relieves), enterprises have faced some negative effects which were not accurately previewed. As a result, enterprises have closed their businesses because of lack of profits and sometimes suffered from large economic losses.

The main drawback for the delocalised companies has been the increase in lumber prices which has been due to the demand growth in the incoming wood working firms from abroad (not only Italian, but also Austrian, German, French and Spanish). Those companies, instead of implementing cooperation strategies, have been in competition for the supply of lumber. As a consequence of the similar development, also the energy costs, the taxation and the salaries have increased, although the labour cost have still remained low. For some a 'fatal' obstacle has been the lack of experience in operating outside the traditional industrial district, resulting into new technical and administrative challenges.

Despite of the loss of the initial competitive advantages, the most experienced companies, which had largely invested in infrastructure and machineries in the last years, chose to maintain their production in Romania waiting for the growth of local

markets. Some companies were planning to establish new production also for the final production stages in Romania, therefore enlarging their production chain to include also the activities so far implemented only in Italy.

The examples of re-creation of full industrial district dynamics by Italian SMEs in Romania are however, still rare. Where the industrial districts were developed, they were not supported by the Italian firms alone, but also by Romanian or other foreign actors present in the area.

One interesting company present in Romania was GROUP LEMN, a company manufacturing wooden components for dining chairs, tables and other furnitures. The company was established by three Italian companies belonging to the so called 'chair triangle' (industrial district in Udine province). Twenty years ago this group founded GROUP SEDIA in Italy (sales and marketing company promoting 65 million US\$ in furniture sales each year worldwide) and in 1997 they establishing a new joint-enterprise in Romania.



Figure 5. Case companies location in Romania.

The company is managed by three Italian members, but the local manager is a Romanian. The company has 180 employees, it processes 40 000 m³ of wood per which is expected to grow in the future. The company appears seriously interested in

making long term investments in Romania. In 2002, thanks to an additional investment made by an other Italian firm, GROUP LEMN decided to expand its production with a new operative branch producing planks and spruces beams, finding immediate success in the Western and Eastern European markets.

GROUP LEMN is an example of a long term investment which can have a positive impact on the local employment also (the company has more than 250 employees with permanent jobs). It would be interesting to investigate and compare the consequence in employment at the districts level in Italy, where the firms' production originates.

3.2 Case study on delocalisation of Holzindustrie Schweighofer to Romania

General information and description of the case study enterprise

Holzindustrie Schweighofer (HS) is a family business started in Austria about 350 years ago. The company has grown recently into a big transnational company. The company developed its processing for a long period of time in Austria. Just recently the company sold its 3 million m³/year capacity in Austria to a Finnish producer Stora Enso and invested the earned capital into similar business in Eastern Europe.

In the history of the 350 years family business in wood processing, the first factory of the company was set up in Brand, Austria. It produced 1 000 m³ of sawn wood per year. Another mill was built in Ybbs. The total yearly production of Schweighofer in Austria was 1 million m³. In 1995, Schweighofer decided to expand its production into Czech Republic, buying and restoring the biggest sawmill there. In 1998, the group, thereafter named as Holzindustrie Schweighofer, produced 3 million m³ of sawn wood per year. In 2002, HS decided to invest 70 million Euro in a big sawmill in Romania. This factory processed 800 000 m³ of round wood per year. Driving forces for investing in wood processing in Romania can be considered to include the following reasons:

- Large raw material supply at low cost and high quality,
- Low cost of labor,
- Low competition in the soft sawn wood processing; although Romania has a lot of sawmills specialized in soft wood, the mill are small in size with a capacity between 1000 and 2000 m³ per year. The technology used in these small sawmills is rather old and consequently the productivity is rather low. For local companies the level of costs is very high and the quality of the final products low, which leaved space for major new investments in this field.
- Encouraging legal framework. To attract major investments in wood processing industries, the investors can make contracts with state forests under the Law

654/2002, for the supply of raw material for ten years. In that way, even big investor can have the warranty for a stable supply of raw material in the initial stages of startups. HS utilized this opportunity, bid and won a concession on a large amount of resinous standing wood. HS contracted the harvesting with local companies and an Austrian company, FORIA OBF, that has is partially owned by the Austrian state forestry, OBF.

- Cluster solutions available. The location (Sebes) was chosen, amongst other factors, because there already operated a large MDF factory that was able to use all wood wastes from sawing. That's why the technology applied includes first chipping, in order to shape logs into more geometrical figures, after which more proper sawing can take place. For synergic reasons, the MDF FRATI GROUP and HS formed a sort of cluster in Sebes. Nowadays, MDF FRATI GROUP has sold their business to KRONOSPAN, another well known Austrian OSB and MDF producer.
- Transport infrastructure: Sebes is well connected with a new highway and it is located at the junction of big railways, near Constanta harbour.
- Romania has the potential to develop into a large domestic market in the future, due to a relatively large population base of 22 million inhabitants.

Problems and solutions

By processing 800 000 m³ of resinous round wood per year, HS has largely affected Romanian wood markets. Price of spruce round wood has increased after HS started its production. Other mills have been forced to use more fir and pine because the availability of spruce was dramatically diminished.

Currently, HS wood supply is based on 80 % of spruce from Romania, 10 % of spruce from Ukraine and 10 % of pine from Ukraine. Recently, HS has started to build a new major factory in North East Romania, in Suceava district, which is the largest supplier of resinous round wood in Romania. Roundwood from Ukraine can be also used in this factory.

The 100 million euros HS investment in Suceva is soon doubled with another large investment made by an Austrian group EGGER, building an OSB factory that uses the HS wood wastes. This way similar cluster formation as in Sebes is rebuilt in Suceava.

HS produces sawn wood, beams for prefabricated houses, wood for buildings, do-it-yourself (DIY) stuff and profiled sawn goods. All production is exported to different regions, such as USA, Far East, Middle East and Europe (Table 3).

Table 3. Distribution of HS production to different markets (thousands m³).

| Market | 2004 | 2006 |
|--------------|------|------|
| Europe | 95 | 80 |
| Middle East | 85 | 70 |
| Asia | 85 | 165 |
| USA | 30 | 90 |
| Total | 295 | 405 |

HS export to Japan and Asia has quickly doubled, which has increased the interest of HS for these markets. Further expansion of markets toward East can be expected. The geographical location of HS at the border between European Union and CIS countries and Russia is especially attractive, as Romania is entering the European Union in 2007.

4. CONCLUSIONS

The process of internationalization and delocalization of timber and furniture enterprises can be, for several aspects, considered similar to other industrial sectors. The low cost of raw material and labor, low taxation, easy and less controlled environmental rules are among the main reasons which encourage these industries to move to other locations.

There is, in developed as well as in developing countries, a very active debate on the effects, both in the short and long term, of this process of internationalisation and delocalization. Regarding to the loss of jobs in the country of origin, there is a certain consensus (at least in Italy) on the fact that the labour markets are generally able to absorb the sudden increase in labor supply. But the loss of jobs is not the only effect induced by internationalisation and delocalization. At local or district level, delocalisation produces also important changes into the organization of work as well as it disturbs the complex system of inter-firm relationships, which in general are delicate systems of relationships at the industrial district. Delocalisation also produces a risk of disappearance of some technical competence at local level (Mariotti 2004).

With reference to Romania, it is clear that the establishment of new production units brings advantages and disadvantages for the local forest entrepreneurship. On the one hand, new foreign investors are good consumers of rough material, investments create new jobs, and they stimulate the economic growth of the area. On the other hand, foreign investments tend to be in competition with local investments and they induce a risk to reduce chances for growth (albeit often also the possibility to start) in local businesses and enterprises.

Nowadays, the decisions on the location of production in a country is becoming more important, following the search of attractive locations for mills in terms of raw material supply and market conditions. HS is a good example of this strategy, illustrated with the decision to locate its new factory in East Romania near Ukrainian wood resources and forthcoming EU non-EU border.

In general terms, with reference to the introduced HS case study, some strengths and weaknesses can be underlined in the process of internationalisation and delocalization. Strengths include the following:

- Delocalisation brings large investors and new capital into developing countries and this can activate industrial production throughout the respective production chain
- Technological improvements and productivity increase can result into a more efficient use of resources (wood) and into a reduction of the environmental impact of industrial activities
- Know how is 'exported' from the origin country to the target country
- Delocalisation encourage other enterprises' development and growth (like forestry contractors) because the growing industrial centres include stable and affordable clients

On the other hand some weaknesses of internationalisation and delocalization can be underlined:

- Delocalization usually brings a large actor into a weak and fragmented markets, which can be harmful for the market and the investors themselves
- Delocalisation tends to increase unemployment rate in the country of origin
- Delocalisation affects the fairness of competition; large industrial capacities tend to create monopolistic markets, reducing the opportunities for small enterprises to operate in the markets
- Delocalisation may deepen the gaps in regional development if investments are concentrated only in few regions

In the case of international and delocalisation of the structures of industrial districts, the growth of foreign clusters into new countries could become a real opportunity. This is especially true if the formation of new industrial districts follow the so called 'propagation development model' (Viesti 2000) where a full production chain is enlarged abroad through the following changes:

- Transformation of the local clusters into nodes of larger and international systems
- Transformation of short networks into longer networks
- Transformation of domestic social capital into a more complex and articulated systems, able to sustain long-distance relationships

In other words, it is necessary not only to relocate the activities abroad but to transfer the whole system. This include investments in physical infrastructures (transport and logistic) and business-friendly institutional infrastructure, education and training (including reduction of local bureaucracy), safeguard of good access to financial resources and establishment of organisations being able to represent the interests of the investors (Baga 2003).

REFERENCES

- Baga E., 2003. Timisoara, nuova provincia veneta. Unpublished working paper. Frankfurt am Main: Johann Wolfgang Goethe-University, Institute for International Relations and Comparative Political Studies.
- Bresolin, T. and Biscaro, Q., 2001. Problematiche di internazionalizzazione dei distretti industriali della provincia di Treviso. Camera di Commercio Industria Artigianato Agricoltura di Treviso. In Italian.
- Dei Ottati G., and Becattini G., 1987. *Il Mercato Comunitario*. In: Becattini G., (ed.). *Mercato e forze locali: Il distretto industriale*, Il Mulino, Bologna. In Italian.
- Eurostat, 2005. *European Union Foreign Direct Investments yearbook*.
- FAO. 2006. *Statistical database of Food and Agriculture Organization of the United Nations*. <http://faostat.fao.org>
- Fuà, G., 1980. Problems of lagged development in OECD Europe: A study of six countries, OECD, Paris. Document No. 2277 – derestricted.
- Fuà, G. 1983. L'industrializzazione del nord e del centro. In: Fuà G. and Zacchia C. (eds.). *Industrializzazione senza fratture*. Bologna, il Mulino. In Italian.
- Garofoli, G., 1983. Le aree sistema in Italia. *Politica ed Economia*. No. 11. In Italian.
- Garofoli, G., 1991. *Modelli locali di sviluppo*. Milano, F. Angeli. In Italian.
- Grainville P., 2004. An analysis about new European geographical economy with 25 Members. *European Trade Study Group, Nottingham*.
- Hanzl, D. and Urban, W., 2000. Competitiveness of industry in candidate countries. forest-based industries. *The Vienna Institute for International Economic Studies (WIIW)*. http://www.wiiv.ac.at/pdf/competitiveness_forest.pdf

- Mariotti I., 2004. Internationalisation: Threat or opportunity for the survival of the Italian district model? *IWSG Working Papers 9-2004*. Frankfurt University.
- Merlo M., Cavalli R. and Cesaro L., 1996. New curriculum development with private financing in Italy: Technical level diploma in timber technology. *FAO Advisory Committee on Forestry Education*. Santiago (Chile).
- OECD, 2005. *International Direct Investments Yearbook*.
- Viesti, G., 2000. *Come nascono i distretti industriali*, Laterza, Roma-Bari. In Italian.
- World Bank. 2005. *Investment Climate Surveys – Draft Country profile. Bulgaria (2005 Survey)*.

DELOCALISATION OF WOOD PROCESSING INDUSTRY FROM FINLAND TO THE BALTIC COUNTRIES

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1. INTRODUCTION

Since the beginning of the 1990s there have been major structural changes in the Baltic Sea area. In wood sector the changes have affected, for example, softwood log usage and primary wood-processing industries by changing their business environment and increasing the competitiveness of the companies. The privatisation in wood product industries as well as in land tenure initiated from the declaration of independence of the Baltic countries. The growth of interstate roundwood trade within the Baltic Sea area countries has increased rapidly thereafter.

The accession of the Baltic countries into the European Union in May 2004 has further deepened the general economic integration in the region. The integration of national roundwood markets in the Baltic Sea area have preceded in two distinct stages. The exports of roundwood from the Baltic countries to Finland and Sweden expanded in the first stage, and the delocalisation of primary wood processing industries from Finland and Sweden to the Baltic countries constituted the second stage. The delocalisation of primary wood processing plants has comprised capacity expansion within the consolidation of Baltic companies into the transnational forest industry corporations (TNC) in Scandinavia with a power to coordinate and control operations in more than one country (Dicken 1998, Korhonen 2005).

The business environment of primary wood processing industries in Finland has changed fundamentally due to the increased competition in the international timber and wood panel markets, and the weak price development for the final products (Mutanen et al. 2005). Sawmill plants producing standard sawn timber assortments have had low profitability in Finland and Sweden, which has promoted delocalisation investments of the TNCs. The wood procurement strategies of Scandinavian TNCs have changed parallel with the delocalisation investments during the last ten years. Roundwood imports of primary wood processing industries, mainly originating from Russia to Finland, have four folded since 1995 and the distribution of the imports has also changed as a result of delocalisation investments.

Since the 1990s, there have been contemporaneous trends of establishing new wood processing plants in the Baltic countries and disestablishing production units in Finland and Sweden. The greenfield investments and business acquisitions made by these forestry conglomerates in the Baltic area have comprised two elements: increasing the production capacity in the new countries and rearranging production among production units by increasing their specialisation by product and customer segments. The structural changes made in Finnish and Baltic forest industries have had consequential impacts on employment, use of forest resources, silviculture, wood procurement and logistics together with their multiplicative effects in country-wise economies.

The aim of this paper is to shortly review the delocalisation investments in primary wood processing industries from Finland to the Baltic countries and to evaluate the major drivers behind the delocalisation. Delocalisation evaluations cover the major capacity rearrangements made in Finland and the Baltic countries. Assessments also include the changes in the relative domestic and imported softwood prices in Finland, which have affected on the distribution of wood usage between the countries.

Delocalisation decisions are assumed to be outcomes of three factors. The first aim is to decrease the total production costs in primary wood processing industries. The second target is to increase the ability to affect roundwood market actions in the Baltic countries, but also in the countries exporting roundwood to the Baltic countries. The final focus is to seek for synergies in wood procurement and increase vertical integration.

The wood procurement of pulp and paper mills of the TNCs is an integrated part of their business strategies. Thus, the procurement flows of sawmill residual and pulpwood from the Baltic countries to the pulp and paper mills in Finland and Sweden are included in making decisions about delocalisation. Pulp and paper production units are indifferent between the use of domestic or foreign sawmill residue and pulpwood. The key factors are predictability and availability of raw material.

2. BACKGROUND FOR DELOCALISATION

The background for delocalisation is a combination of location conditions and location factors. General location conditions refer to the institutional conditions, such as abolition of restrictions linked e.g., to liberalisation of trade and foreign ownership. Location factors are specific factors met by a specific firm in a certain industry. For

example, possibility to strengthen market position or to find new forms of business operations, such as making greenfield investments or collaborative arrangements with other firms. (Nishioka & Krumme 1973).

Delocalisation of production plants from one country to another requires typically an industry-specific driving force. According to Hayter (2004), both tangible and intangible factors impact on the decision of delocalisation. Tangible delocalisation conditions (e.g., wages, construction costs and taxes) typically enforce firms to delocalisation, whereas intangible ones (e.g., security, quality of infrastructure and processing skills) act as a fundamental preconditions for delocalisation.

Delocalisation decisions of primary wood processing industries in Finland and Sweden have been affected both by the tangible and intangible location conditions. However, in this work the focus is to a large extent on the latter ones. For a heuristic intuition, figure 1 illustrates the reasons, which can be considered as a driving force for reorganising production in Finland as well as acquisitions and greenfield investments in the Baltic countries. In the very early 1990s, intangible delocalisation conditions in the Baltic countries were not especially beneficial for making acquisitions and greenfield investments, which at that time supported the expansion of roundwood imports from the Baltic countries to Finland. Compared to the Finnish raw material, both the availability and the price competitiveness of the Baltic logs increased the demand of imported raw material and improved the profitability of primary wood processing industries located in Finland in the late 1990s and early 2000s.

The increased competition in the production factor markets for the primary wood processing industries, and especially those of softwood roundwood, have made location factors favourable in the Baltic countries from the mid 1990's on. Since then, delocalisation of Finnish corporations in the Baltic countries has been occurring first in the form of acquisitions, and thereafter through enlargement and repair investments. The evaluation among the TNCs to delocalise their timber and wood panel production into the Baltic countries traces back to the increased volumes of imported softwood from the Baltic countries and Russia to Finland. Increase in the softwood imports made an increasing share of roundwood imports competitive with domestic softwood and hardwood log markets. Softwood imports were a crucial part of roundwood procurement in primary wood processing.

The delivery of sawmill residue and pulpwood originating from the purchases in the Baltic countries has been involved in the strategies of acquiring raw material into

the plants owned by Scandinavian TNCs. The Baltic sawmills of Scandinavian TNCs deliver their sawmill residues for the usage of their pulp and paper mills both in Finland, Sweden and Central Europe. This makes Baltic sawmills more versatile compared with Finnish sawmills. As a whole, for the Scandinavian TNCs, the Baltic investments have been and still are an important part of their business strategies. By delocalising Finnish companies have increased their production capacities and rationalised their operations, which has been seen in the form of seeking cost-efficiency and better customer orientation with plant-wise specialisation into certain markets and customer segments.

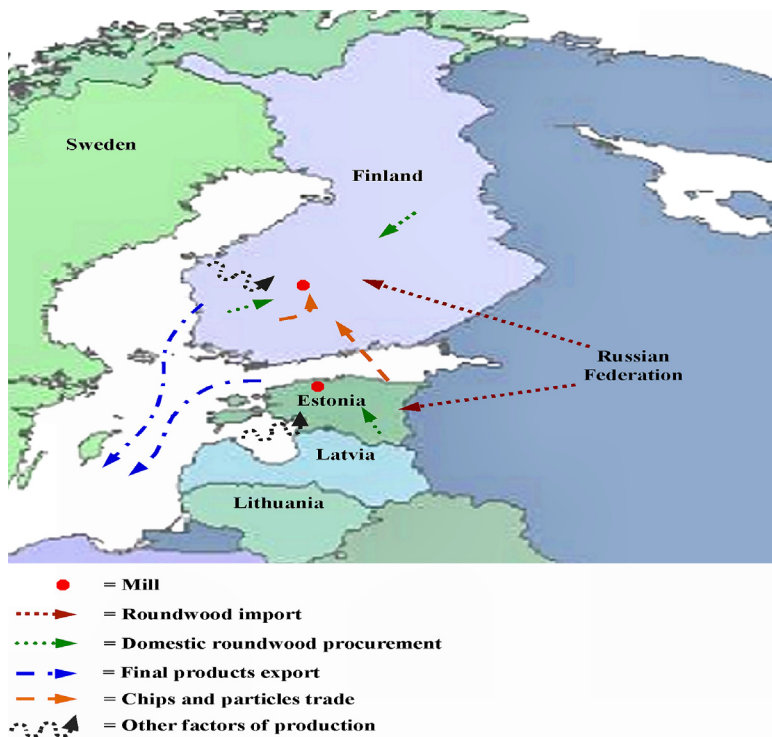


Figure 1. Factors affecting delocalisation of wood processing industries in Northern Europe.

While the production and export volumes from Russia have increased considerably during the last years, the over supply in final markets in Europe has led to decreasing price development of sawnwood. Especially, this has occurred for pine timber creating further challenges for the survival of the primary wood processing industries. As a result, other cost items, such as the location of sawmills to minimise the transportation

costs, have become more important for improving the profitability of sawmills in Estonia, Latvia and Lithuania.

By definition, investments of Finnish forest industry companies to primary wood processing capacity in Estonia, Latvia and Lithuania can be classified primarily to delocalisation investments in the sense of production capacity allocation, and secondarily to incremental modernisation investments. The incentive for the first category comprises expansionary investments to expand business activities for new markets and to utilise unused timber resources of the new host countries. The second category is more related to the integration strategies of the forest enterprises to deliver wood residues to pulp and paper industries. The final category consists of factors, which are closely related to production and unit costs. By delocalisation investments, companies may redistribute their primary wood processing plants with similar technologies. As a result of this, production costs may be decreased and international competitiveness amended.

The primary wood processing industry delocalisation investments made by Scandinavian TNCs into the Baltic countries have had supporting and impeding impacts on the domestic softwood markets and profitability of local companies, as well as to their softwood exports and imports. However, these investments may create spillover to the secondary wood processing industries, such as SMEs in timber building and furniture component branches in Estonia, Latvia and Lithuania.

Business opportunities of the delocalising companies can be supported by the public policies of the new host countries. On the other hand, in the long run delocalisation tends to integrate input prices between the original production areas and new host countries. This is due to the decreasing aggregate demand of roundwood in the domestic markets of the delocalising company. Increase in the roundwood prices challenges the profitability of the current domestic primary wood processing industries, and attracts investing in countries with lower production costs. As a result, international competitiveness of the primary wood processing industries increases both in the home country and in the new host countries.

3. INDUSTRIAL ROUNDWOOD USE AND TRADE BETWEEN THE BALTIC COUNTRIES AND FINLAND

3.1 Estonia, Latvia and Lithuania

The annual removals as well as imports of industrial roundwood have increased in the Baltic countries between the early 1990s and early 2000s (Figures 2 and 3). Estonia has tripled and Latvia doubled their annual removals from the beginning of the 2000s (2003). In Lithuania, the increase in the volumes of local industrial removals has increased modestly (14 %)¹. Annual domestic removals and import of industrial roundwood started to increase in the Baltic countries since the late 1990s with the country-wise growths between 70-80 %. The industrial roundwood imports originating from Russia comprised close to 80 % of Estonian, over 60 % of Latvian, and close to 50 % of Lithuanian imports during 1997-2003.

The country-wise developments among Estonia, Latvia and Lithuania differ from each others in terms of absolute magnitudes. The industrial roundwood import volumes in 2004 were 200 000 m³ into Lithuania, 1 465 000 m³ into Estonia and 800 000 m³ into Latvia. The availability of local raw material has been sufficient in Lithuanian wood processing industries, and the development of the private forest sector is expected to affect positively the market situation in the future (EKT Group 2004).

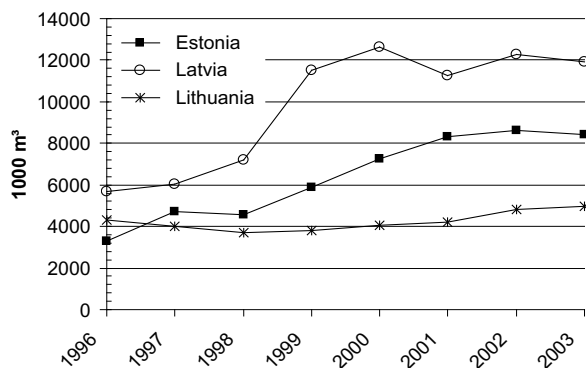


Figure 2. Annual removals of industrial roundwood in the Baltic countries in 1992-2003 (Finnish Forest Research Institute 2006).

¹ The information of the loggings and wood trade are based on the statistical databases of FAO (2006) and Finnish Forest Research Institute (2006). Due to the data characteristics, there may be differences between the figures below and, e.g., information available in national data sources.

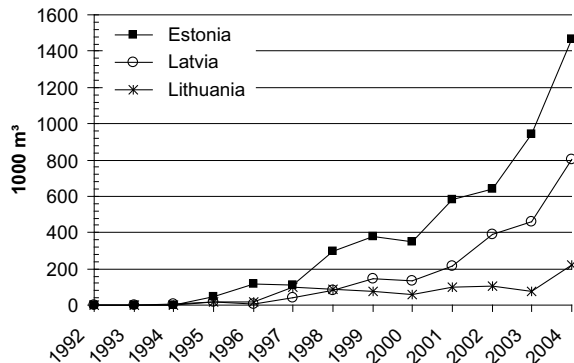


Figure 3. Industrial roundwood imports into the Baltic countries in 1992-2004 (FAO 2006).

All Baltic countries were net exporters of industrial softwood during 1999-2003 with total net exports of 7.4 in Estonia, 8.4 in Latvia and 3.4 million cubic meters in Lithuania. Since there does not exist any considerable pulpwood processing plants in the Baltic countries, most of the softwood exports were raw material used by pulp and paper industries located in Finland, Sweden and Germany. Because the logging volumes of sawlogs have exceeded the sustainable annual level of removals in the Baltic countries, especially in Estonia, the imports of sawlogs have increased recently (Toppinen et al. 2005). Lithuanian primary wood processing industry acquires the raw material mainly from local sources. For example, in 2003 the imported wood comprised only 1.5 % of the wood consumption. Still continuing privatisation of forests supports the positive expectations for the availability of local wood also in the future (EKT Group 2004).

3.2 Finland

The annual volumes of industrial roundwood removals have remained stable in Finland since the late 1990s irrespective of the increase in the use of industrial roundwood in the forest industries. There was an increase of 25 % in the average annual industrial roundwood removals during 1992-1998, but only 2.5 % during 1998-2004 (Figure 4). The average annual softwood use has increased 5.3 million m³ (from 25.8 mill. m³ during 1995-1998 to 31.1 mill. m³ during 1999-2004) and that of hardwood 0.2 million m³ (from 1.5 mill. m³ during 1995-1998 to 1.7 mill. m³ during 1999-2004) in primary wood processing industries (sawmills and wood panel industries).

In 2002, Finnish wood products industries consumed 30.26 million m³ of logs. Sawmills used 87 % of the raw material, while plywood and veneer industry had the proportion of 12 % of the usage. Sawmills used 92 % of the softwood logs, whilst plywood and veneer industry had a share of 7 %. From hardwood logs, plywood and veneer industry processed 88 %, and sawmills the remaining 12 % (Figure 5) (Finnish Forest Research Institute 2005).

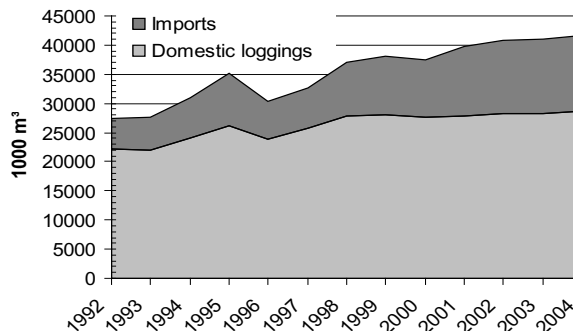


Figure 4. Domestic removals and industrial roundwood imports into Finland in 1992-2004 (Finnish Forest Research Institute 2006).

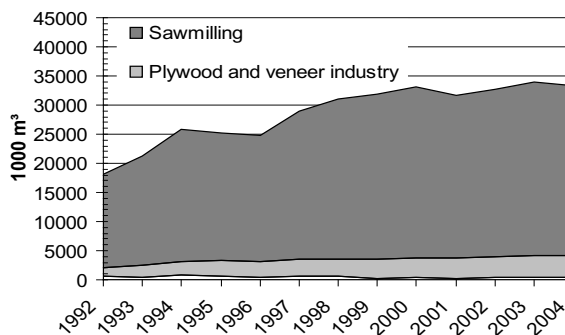


Figure 5. Roundwood use in Finnish primary wood processing industries in 1992-2004 (Finnish Forest Research Institute 2006).

In pulp and paper industries, there has been an increase in the average annual use of wood. Softwood roundwood usage has increased 1.1 million m³ (from 22.7 mill. m³ during 1995-1998 to 23.8 mill. m³ during 1999-2004) and that of hardwood roundwood 2.7 million m³ (from 10.4 mill. m³ during 1995-1998 to 13.1 mill. m³ during 1999-2004). There has also been 1.8 million m³ increase in the use of wood residue in pulp and paper industry (from 10.8 mill. m³ during 1995-1998 to 12.6 mill. m³ during 1999-2004).

The balance between total removals and industrial use of wood is due to roundwood imports. There was a 40 % increase in the imports of industrial roundwood during 1998-2003. In wood processing industries, half of the increase in the annual softwood usage was based on the increased imports during 1998-2004, when the imported wood partly substituted domestic hardwood logs. The share of the Baltic countries in the total industrial roundwood imports into Finland has declined from the proportion of 10 % in 1998, down to 7 % in 2002.

Industrial roundwood markets were strictly restricted from the 1970s to the late 1990s as a part of centralised roundwood market contracting (e.g. Ollonqvist 1998). This rationing through bilateral price settlement between wood industries and forest owner representative organisations covered strict quota rules also on roundwood imports. Imported industrial wood was considered as a complementary source of raw material in the circumstances, where the domestic supply was not able to meet the domestic demand (Ollonqvist 2000a).

Domestic roundwood price level decreased sharply in 1991, partly as a result of the end of the comprehensive contracting, partly because of the sharp decrease in demand (Ollonqvist 2000b). The decrease in domestic roundwood use during 1992-1993 led to reorganising wood procurement in Finnish forest industry firms. These new arrangements were partly related to the consolidations and formation of the new Scandinavian TNCs during the second part of the 1990s. During the reorganised domestic roundwood market contracting system in 1994-1999, there was a continuous increase in the domestic roundwood prices in Finland. As a result, Finnish forest industry firms were motivated to develop their roundwood import procurement systems, which boosted the demand of imported industrial softwood. The real valued domestic softwood prices turned downwards as a result of discharging the price contracting system. The volumes of imported softwood increased irrespective of the price increases because of the price margin on behalf of import. The price level of imported softwood has thereafter exceeded the domestic softwood price index (Figure 6).

Raw material costs comprise most of the production costs in sawmills, and they are also among major ones in wood panel industries. The decrease in the difference between the unit prices of domestic and imported softwood supported strategic planning of sawmill delocalisation among Finnish TNCs. Sawmills in the Baltic countries and Northwest Russia had cost advantages through low costs of production. Delocation investments of Scandinavian TNCs could be expected to converge roundwood prices in the Baltic Sea area.

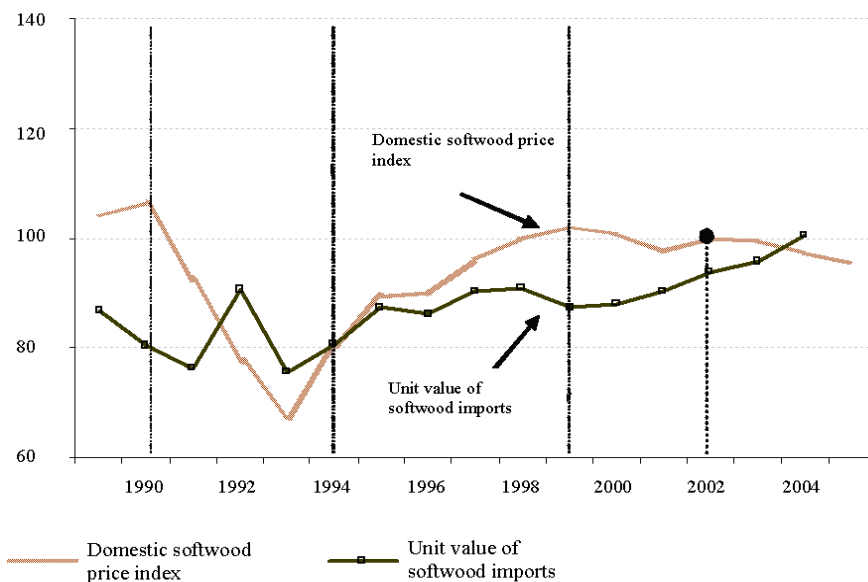


Figure 6. Domestic softwood price index (2002=100) and the development of the unit values of imported wood (Finnish Forest Research Institute 2005, Board of Customs 2005). Domestic softwood price index is based on stumpage price development but calibrated with roadside prices.

The price advantage of imported hardwood has not been similar to softwood. Actually, throughout the period from the 1990s, the price of imported hardwood has been above the domestic price. The basis for the continuations of hardwood imports can be traced to the excess domestic demand. Equilibrium price of hardwood has *ceteris paribus* been lower through the complementary imports. Low investment interests of Scandinavian TNCs to plywood and veneer industries in the Baltic countries and Northwest Russia can partly be explained through the roundwood price difference.

4. SAWMILLING AND PLYWOOD MANUFACTURING IN THE BALTIC COUNTRIES AND FINLAND SINCE THE 1990S

4.1 Estonia, Latvia and Lithuania

The primary wood processing sectors of the Baltic countries have gone through major structural changes since the collapse of Soviet Union in 1991. The large, vertically integrated production complexes were divided into smaller units and privatised, whereas state-ownership in silviculture was continued. There has been a rapid growth of wood sector entrepreneurship in the Baltic countries partly driven by the gradual

removal of trade barriers and accessibility of foreign investments from 1993 on (Hanzl and Urban 2000). Aggregate sawn timber production in 2004 was more than five times the production in 1992 in the Baltic countries. Plywood production grew two and half fold between 1992 and 2004. There were, however, country-wise differences in the product branches (Figures 7, 8, 9 and 10). The export surplus volumes in Estonia during 1992-2004 can be explained by the high volumes of plywood imports (106 000 m³ in 2004 for example).

In the Baltic countries, there were two basic types of sawmills at the time of the collapse of the Soviet era. One type of sawmills were vertically integrated to large complexes, and other type of local sawmills were owned by collective farms and state farms. Privatisation of forest industries began in Estonia in 1991 and was completed in 1995. Roundwood sales provided income for the establishment of new companies focusing frequently to small-scale sawmilling. The circular saw technology was frequently applied in Estonia, whereas small drum sawmills were more common in Latvia.

The export of sawlogs increased rapidly in the Baltic countries during the first half of the 1990s. Latvia set up high custom duties on the export of saw logs (12-20 USD/m³) and veneer logs (up to 36 USD/m³) to protect their domestic market stakeholders and to keep local sawmills profitable (Kirsis 1995). In Lithuania, the export of pine saw logs (diameter higher than 20 cm) was totally banned from April 1st 1995. In Estonia, however, no roundwood export restrictions or limitations were established. High softwood log prices promoted making new investments in sawmills in order to enhance the profitability of companies. In the roundwood markets, the competition among the companies was vivid in 1995-1996, when the first modern sawmills were built in Estonia, Latvia and Lithuania.

The change of the Baltic wood industries is still under restructuring due to the recent accession to EU. Abreast with the new opportunities arising from the access to the European timber markets, the memberships bring also new challenges in terms of increase in production costs, e.g., in wage levels, and increasing competition from neighbouring countries and overseas producers (Ministry of Agriculture and Forestry Finland 2005).

In Estonian sawmills, raw material procurement has become more intense as the domestic wood resources have become more limited, especially in the case of high-quality industrial logs. Local raw material is competitive mainly due to its price and accurate deliveries, but due to the seasonality of forest harvesting driven by

legislation, local raw material is not available all-year around. The problems caused by the seasonality of raw material availability, is partly compensated by wood imports from Latvia, Lithuania and Russia. Yet, the high price of Russian wood when imported to Estonia is an impediment to industries, together with the irregularities in deliveries (Enterprise Estonia... 2002).

In Latvian wood processing industry, the stable local raw material base is seen as a factor securing the development of the sector. However, the prices of raw material have increased since 2003 including financial unsustainability and either closing-up plants or transfer of their ownership to larger corporations. In addition, increase in production volumes has boosted the competition in the local raw material market, and recently there has been a considerable increase in the roundwood imports, especially from Russia and Byelorussia, but also from Lithuania. By business branches, plywood production plays more important role in Latvia than in the other Baltic countries (Akerfelds 2003).

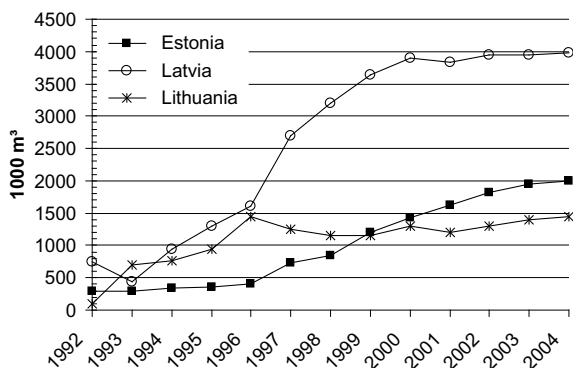


Figure 7. Production of sawnwood in the Baltic countries in 1992-2004 (FAO 2006).

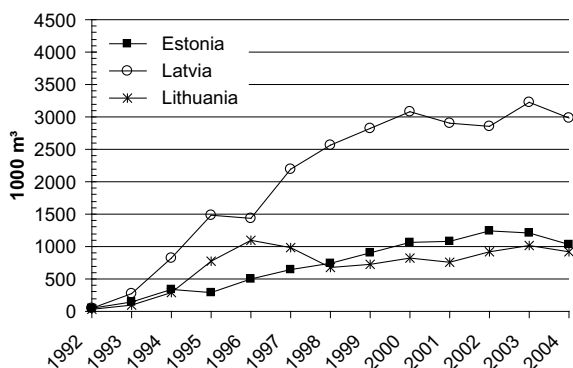


Figure 8. Exports of sawnwood from the Baltic countries in 1992-2004 (FAO 2006).

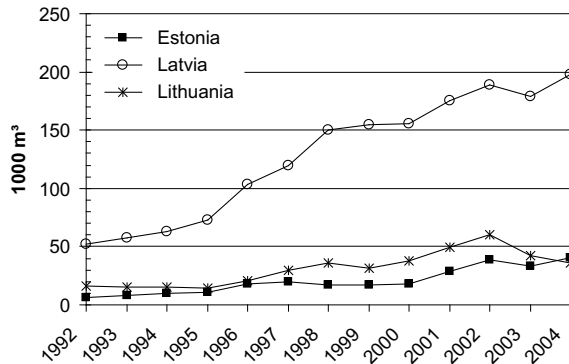


Figure 9. Production of plywood in the Baltic countries in 1992-2004 (FAO 2006).

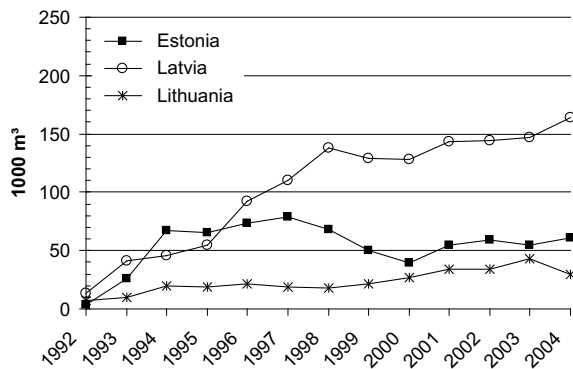


Figure 10. Exports of plywood from the Baltic countries in 1992-2004 (FAO 2006).

Currently, most of the local raw material used by the Lithuanian wood industries is obtained from the state forests. Due to the large unused potential in private forests, local raw material availability is seen as sufficient also in the future as the development in private forestry continues. In addition, also the imports from Russia are seen as an opportunity for the sector. Compared to Estonia and Latvia, no considerable changes in industrial wood prices have been occurred, and the price level has remained slightly lower than those in neighbouring countries (EKT Group 2004).

The competition among buyers has direct impacts on the financial sustainability of the wood processing industry business in the Baltic countries. The simultaneous increase in production costs and decrease in timber prices in the international market has affected the competitiveness of these companies (e.g., Enterprise Estonia... 2002, Akerfelds 2003). The development of Russian sawmill industry is seen as a threat in

Estonia, even though at the moment, the Scandinavian companies, e.g. Finnish and Swedish sawmills, are the main competitors for the Estonian wood processing firms. On the other hand, most of the side-products of sawmills, such as chips, are bought by Scandinavian pulp and paper companies.

In Latvia and Lithuania, the growth of sawing capacity has continued also in the 2000s, and in Lithuania the wood sector is even one of the fastest growing manufacturing industries (Akerfelds 2003, EKT Group 2004). In each of the Baltic countries, foreign direct investments in wood processing industries has been a factor for supporting positive technological development, quality improvement, and international competitiveness (Enterprise Estonia... 2002, Akerfelds 2003, EKT Group 2004). As in Finnish wood sector (e.g. Selby and Petäjistö 2002), in terms of proportion of companies, SMEs dominate the wood processing industries in the Baltic countries.

4.2 Finland

Since the early 1990s, major changes have occurred in the Finnish forest sector. Major restructuring is due to the consolidations and formation of Scandinavian TNCs. The TNCs have been active in making foreign investments (through consolidations, joint venture companies and new investments). The proportion of exported production has remained rather stable in plywood industry during 1992-2004, whereas exports of sawnwood have stabilised from the late 1990s (Figures 11 and 12). The development in sawmilling industries is partly due to the delocalisation investments made by forest companies of Finnish origin.

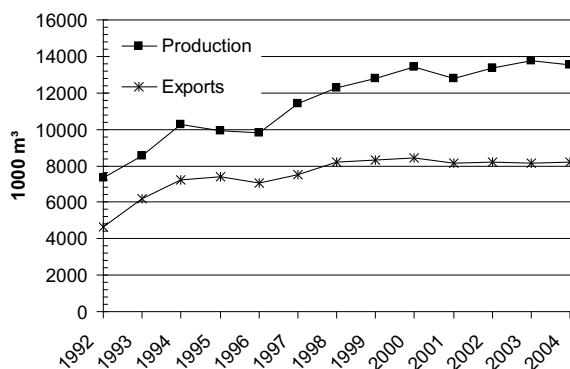


Figure 11. Production and exports of timber in Finland 1992-2004 (FAO 2006).

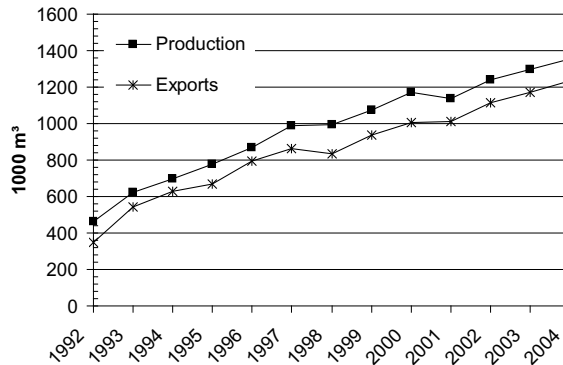


Figure 12. Production and exports of plywood in Finland 1992-2004 (FAO 2006).

Since the last decade, the tightening competition in the European timber markets and increase in softwood log prices have weakened the profitability of the wood processing industries. Finnish sawmills, applying modern techniques but processing expensive softwood logs, have had low profitability leading up to the consolidations, closing-ups of plants, and delocalising production capacity. Currently, 40 % of the sawmill capacity of Finnish TNCs is abroad. Finnish small- and medium-sized companies' concentration in manufacturing value-added products is seen as the only option for surviving in the modern competitive arena (Wood Wisdom 2002).

5. PERSPECTIVE OF DELOCALISATION - INVESTMENTS OF FINNISH FOREST COMPANIES IN THE BALTIC COUNTRIES

5.1 Development of Finnish primary wood processing industries since the 1990s

Primary wood product industry investments of Finnish TNCs dates back to the mid 1990s, when current Stora Enso Timber (1994) and Finnforest company (1997) made their first decisions of sawmill consolidations and participating in joint ventures in Estonia. The joint ownership (2/3) of Stora Enso Timber in Estonia continued until 2005, when the minority share was acquired from Stora Enso AS. Also UPM-Kymmene Wood Ltd started primary wood processing in the area from the late 1990s (Table 1). Stora Enso Timber possesses the most of the sawmilling capacity (96 %) of Finnish origin in the Baltic countries, of which the most is located in Estonia. The only Baltic plywood mill in the ownership of Finnish company is Otepää possessed by UPM-Kymmene Wood Ltd.

Availability of resources, access to the markets or market shares, increase in productivity, acquiring know-how and politically stable business environment are among the motives of making investments abroad (see discussion in Korhonen 2005). These motives are partly related to the general location conditions and partly firm-specific location factors affected by market- and firm-level factors. Due to this complexity, it is not possible to unambiguously determine, which of the international investments are delocalising, i.e. moving production from one country to another, and which of them are capacity expansions not including closedowns in the pre-existing domestic units. In order to evaluate this, it is necessary, firstly, to identify changes in the domestic sawmill capacity of Finnish TNCs, and secondly, to evaluate the type of sawmill investments of these companies in the Baltic countries and Northwest Russia.

Table 1. Finnish forest company ownership of sawmills and plywood manufacturing plants in the Baltic countries (Finnforest 2006, Stora Enso 2006, UPM-Wood 2006).

| Sawmills | Country | Mill | Capacity, m ³ | Employment | Raw material |
|----------------------|-----------|-----------|--------------------------|------------|--------------------------------|
| Finnforest | Estonia | Reopalu | 60 000 | 36 | Spruce |
| Stora Enso Timber | Estonia | Imavere | 400 000 | 320 | Spruce and pine |
| Stora Enso Timber | Estonia | Paikuse | 220 000 | 140 | Spruce and pine |
| Stora Enso Timber | Estonia | Näpi | 150 000 | 145 | Spruce and pine |
| Stora Enso Timber | Estonia | Sauga | 130 000 | 140 | Small diameter spruce and pine |
| Stora Enso Timber | Estonia | Viljandi* | 11 000 | 53 | Spruce and pine |
| Stora Enso Timber | Latvia | Laukalne | 215 000 | 144 | Spruce and pine |
| Stora Enso Timber | Lithuania | Alytus | 180 000 | 186 | Spruce and pine |
| | | Total | 1 366 000 | | |
| Plywood mills | | | | | |
| UPM-Kymmene Wood | Estonia | Otepää | 20 000 | 140 | Birch |

* Secondary timber processing unit

The crucial question is to determine, which share of the capacity changes in the Baltic Sea area can be considered as delocalisation investments. Since the late 1990s, almost 800 000 m³ of timber production capacity located in Finland owned by Finnish TNCs has been closed. These closedowns are directly or indirectly related to the investments in the Baltic countries (Table 2). In addition, the production capacity of

Veitsiluoto sawmill owned by Stora Enso Timber has been cut down from 300 000 m³ to 100 000 m³ since the beginning of 2006. In total, the decrease of sawmill capacity of Finnish TNCs has decreased by 1 million m³ since the late 1990s.

Table 2. Finnish sawmill plants closed-up since the late 1990s by the Finnish forestry companies operating in the Baltic countries (Metsäteollisuus 1999, 2000, 2001, 2002, 2003, 2004, 2005).

| Sawmills | Mill | Capacity, m ³ |
|-------------------|----------------|--------------------------|
| Finnforest | Vääksy | 80 000* |
| Finnforest | Ukkola | 80 000* |
| Finnforest | Kiihtelysvaara | 100 000 |
| Stora Enso Timber | Koski Timber | 40 000 |
| UPM-Kymmene Wood | Kuopio | 140 000 |
| UPM-Kymmene Wood | Aureskoski | 300 000 |
| Vapo Timber | Paltamo | 29 000 |
| | Total | 769 000 |

* Capacity estimated

In addition to the Baltic countries, the internationalisation of Finnish wood product industry has occurred also in Northwest Russia where the current sawmilling capacity of Stora Enso Timber is 280 000 m³ (Impilahti and Nebolchi units), and that of UPM-Kymmene Wood 300 000 m³ (Pestovo). Furthermore, in the near future also Metsä-Botnia (softwood sawmills with a total capacity of 400 000 m³) and large Finnish family company Koskisen Ltd (birch sawmill and plywood mill with capacities of 20 000 and 30 000 m³) will have new production units in the area (Campbell Group 2006, Koskisen 2006).

5.2 Delocalisation of Finnish TNCs

Stora Enso Timber is the wood products section of Stora Enso Ltd, the world's third largest sawnwood producer (total sawmilling capacity 7.7 million m³ in 2005, of which in Finland 2.3 million m³), and large secondary wood product manufacturer (volume of value-added products 3.2 million m³). The strategic focus of the company is in manufacturing mass-customised value-added products for large industrial key-customers in carpenter and construction industries, which purchase the products via timber merchants and importer-distributors.

Location of production plants of Stora Enso Timber, organised into Central European, Nordic, and Baltic Production Groups, is based on the accessibility to wood material stocks of Baltia and Northwest Russia, and creating synergies in material deliveries with pulp and paper plants. The order of relative magnitude of production capacity in Nordic and Baltic Production Groups is Finland (46 %), Sweden (19 %), Northwest Russia (4 %) and the Baltic Countries (31 %), including Estonia (17 %), Latvia (11 %) and Lithuania (3 %).

The Baltic Production Group comprises the plants located in Estonia, Latvia, and Lithuania (Table 3). In terms of production volume, Imavere and Paikuse sawmills are the largest timber production units in Estonia (UNECE 2006). The ownership of Stora Enso Timber in the Baltic countries dates back to 1995, when it became a minor shareholder of the AS Sylvester (with slightly less than 20 % ownership share) at the establishment of Imavere sawmill. In 2005, Stora Enso Timber acquired 66 % of the shares of the AS Sylvester sawmill operations, and 100 % of the wood procurement operations (Stora Enso Tilinpäätös 2004). The majority (90 %) of the total production capacity of 900 000 m³ of AS Sylvester comprise softwood products.

The history of AS Sylvester originates back in 1990, when it was founded by a group of forestry specialists to operate in the logging and timber trading business. After the first years, with the focus mainly on roundwood trade, the construction work of the new Imavere Saeveski sawmill was started in 1993. Starting the sawmilling was not without risks, since Imavere was the first modern sawmill in Estonia and a large part of sawlogs was exported at that time. Timber production in Imavere started in July 1995, and in 1996 Stora Enso Timber acquired 33 % of Imavere Sawmill.

Later the investment activities of Sylvester continued via subsidiary companies both in sawmilling (Paikuse and Sauga) and plywood manufacturing (Otepää). In October 2000, Sylvester bought a Näpi sawmill (Laasik 2001a). In addition to local production units, Sylvester has timber manufacturing plants also in Latvia (Laukalne) and Lithuania (Alytus). The most of the Sylvester sawmills were built for utilising softwood, Norway spruce and Scotch pine. The only exception, Sauga sawmill, was built to use grey and black alder, aspen and birch (Laasik 2001b). However, after Stora Enso Timber acquired the Sylvester sawmills, in order to create strategically appropriate production pattern, also Sauga sawmill was switched to utilise the spruce and pine. (Rozental 2003a). Before the changes in the Sylvester ownership structure, UPM-Kymmene was a shareholder of Paikuse sawmill and Otepää plywood factory.

However, after the changes, UPM-Kymmene acquired the ownership of plywood company and sold its shares of Paikuse sawmill.

The sawmill investments made in Imavere have had notable effects on local rural economy. In 1992, Imavere rural municipality was one of the poorest areas in Estonia, with very high unemployment rate. Starting sawmilling operations in the village turned the municipality into one of the richest ones in Estonia, and increased the average annual budget 10-12 %. Sawmilling has had both direct and indirect effects on the employment in the area, and currently there is a problem of finding a skilled labour force in the woodworking industry. In 2004, Imavere area employed 600 workers, of which 250 were working in the sawmill (Rozenal 2004a).

Table 3. Primary wood processing plants in the Baltic countries owned by Stora Enso Timber (Stora Enso 2006).

| Sawmill | Products | Markets |
|---------------|---|---|
| Imavere (ES) | Timber, finger-jointed components, planed wood products, glue-laminated beams | Europe, Japan |
| Paikuse (ES) | Timber, planed wood products | Europe and Estonian secondary processing industries (50 % / 50 %) |
| Näpi (ES) | Timber, planed wood products | Europe and Estonian secondary processing industries |
| Sauga (ES) | Timber, planed wood products | USA, Australia, Baltic countries, Taiwan |
| Viljandi (ES) | Finger-jointed and edge-glued components | Secondary processing industries in Finland, Estonia, Italy, USA, Norway, Japanese construction sector |
| Laukalne (LA) | Timber | Latvia, Estonia, Germany, UK, Egypt, the Netherlands, Austria, Greece |
| Alytus (LIT) | Further-processed wood products | USA, Australia |

Finnforest and UPM-Wood produce most of their sawnwood and plywood in Finland. Sawmill and plywood capacities of Finnforest located in Finland are 2.4 million and 270 000 m³, respectively. The sawmill capacity of UPM-Wood in Finland is 2.3 million m³, and that of plywood 700 000 m³ (Finnforest 2006, UPM-Wood 2006).

In the Baltic countries and Northwest Russia, Reopalu sawmill in Järvamaa, Estonia, is the only production unit owned by Finnforest. In the Baltic area, Finnforest owns wood procurement companies that deliver raw material for Baltic sawmills and pulp production plants in Finland. In addition to Otepää plywood mill, UPM-Wood has invested also in Chudovo plywood factory with a production capacity of 60 000

m³ for birch plywood. Despite of the small proportion of the total plywood production capacity of UPM-Wood, in Estonia Otepää mill is the largest plywood manufacturer (UNECE 2006).

The availability of industrial roundwood is a continuous challenge to all primary wood product industries in Estonia as a result of the rapid growth in the business branch (Figures 13 and 14).

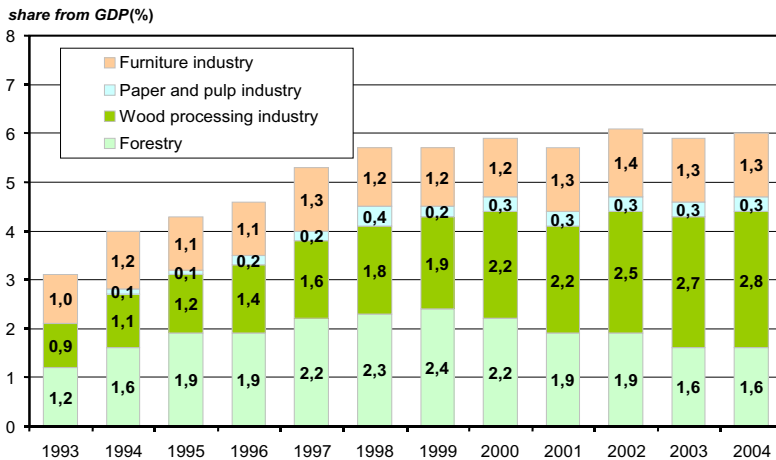


Figure 13. Share of forest industry from gross domestic product (GDP) in Estonia (by current prices) in 1993-2004 (Yearbook Forest 2005).

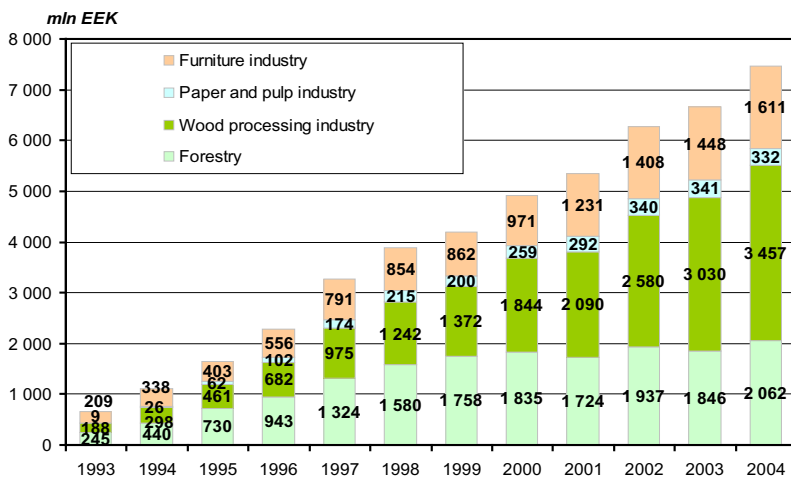


Figure 14. Value-added of forestry sector companies at current prices in 1993-2004 in Estonia (Yearbook Forest 2005).

The largest sawmills and some other wood production plants have been modernised through investments in new machines. The demand of roundwood from these plants has increased domestic roundwood prices and timber imports, mainly from Russia. Roundwood supply from non-industrial private forests has decreased partly due to the changes in legislation made for the better control. Recently, industrial roundwood fellings have decreased to 5.1 million m³ in 2005 (Centre of... 2006). The supply of softwood logs was almost 50 % lower than the total material consumption at the beginning of 2006. In January 2005, the hurricane Gudrun felled lots of forests in Sweden and in Estonia, and influenced also in timber prices. The domestic sawlog prices decreased for a while (Figure 15). Due to the hurricane, in 2005 about 150 000 m³ spruce sawlogs were imported from Sweden.

Lack of modern pulp and paper mills is the major reason for the current roundwood exports from Estonia. A new pulp mill utilising aspen is expected to start in September 2006. Pulpwood exports of the main tree species – pine, spruce and birch – will however continue. Figure 16 shows the increase in timber imports. Decrease in felling volumes and the lack of roundwood for timber industries diminish in the future the roundwood exports. New production lines have been built to use small dimensional timber (e.g. fencing products).

In the first phase of development (until 2000) the primary goal of timber industries was the production of sawnwood. After that, investments to value-adding of primary sawnwood products have increased. As a result, the exported volume of standard sawnwood dimensions has decreased (Figure 17), whereas the quantities of value-added products have increased since 2001. In recent years, the domestic use of sawnwood products by construction industry has increased significantly.

The increased supply of sawmill residue has become an important local semi-product for new entrepreneurship. The production of pellets from sawdust, for example, started in Estonia in 1994. In 2001, the production was 68 000 tons (Rozenal 2004b). At the beginning of 2006, there were three large and several small companies in pellet business and the total annual production capacity was estimated to be 350 000 tons. The production of pellets is limited because of the availability of raw material. In 2003, close to 20 companies were producing timber briquettes (Õisma and Luts 2003). Their annual production capacity is estimated to be 80 000 tons.

The effect of modern forestry and timber industry investments have effected negatively on the micro enterprises in the countryside. A lot of small sawmills have

been closed or went to bankrupt, because they have not been able to compete in roundwood markets.

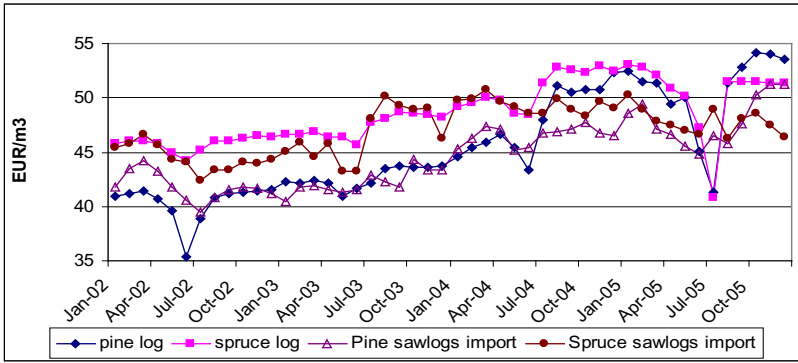


Figure 15. Average monthly sawlog prices of Estonian state forests (RMK 2006) and import prices (Statistical Office of Estonia).

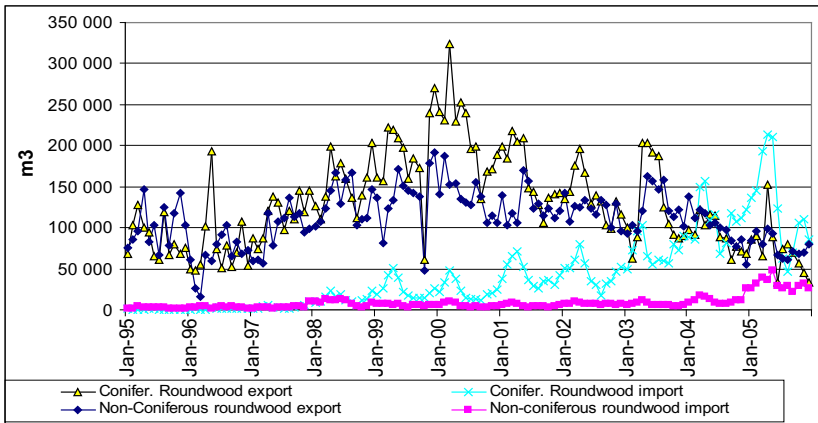


Figure 16. Roundwood imports and exports of Estonia, monthly quantities (Statistical Office of Estonia).

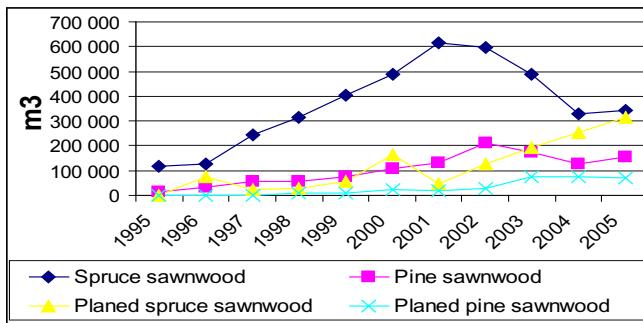


Figure 17. Sawnwood exports from Estonia (Statistical Office of Estonia).

6. CONCLUDING REMARKS

Primary wood processing sectors in Scandinavia and in the societies of the Baltic countries have gone through major structural changes since the end of Soviet era. As a result of reorganisations made in the Baltic countries, in 2004 the total sawn timber production was more than five times higher than in 1992. Similarly, the amount of plywood production grew two and half fold between 1992 and 2004.

The change of the Baltic wood industries is still under restructuring due to the recent accession to EU. Abreast with the new opportunities arising from the access to the European timber markets, the memberships have brought also new challenges, which have already had impact on the production cost levels in the Baltic area. In addition, especially in Estonian sawmills, the procurement of raw material has become more intense as the domestic wood resources have become more limited. This has had direct impact on the competitiveness of those companies.

Abreast with changes in the Baltic countries, major changes have occurred also in the Finnish forest sector as a result of increased timber imports, formation of Scandinavian TNCs, as well as delocalisation of the companies to the Baltic area. Between the 1990s and 2000s, simultaneously with the 1.4 million m³ increase in timber production capacity owned by Scandinavian TNCs in the Baltic countries, there has been one million m³ decrease in the Finnish sawmilling capacity.

The effects of delocalisation investments are twofold. For example in Estonian Imavere municipality, starting the sawmilling operations has had both direct and indirect positive impacts on the economy of the area. Sawmills do not provide employment opportunities merely in timber production, but also in other business branches. Due to the increased supply of sawmill residue, for example, Estonian pellet production has grown notably. On the other hand, starting timber manufacturing in large production units has had negative effects both on the vitality of Estonian micro enterprises and, especially, on the Finnish sawmilling employment. As a whole, the opportunities of small companies and production units located in higher-cost level countries to participate in cost competition are limited. Thus, in the future, increasing the value-added of the products can be seen to provide new business opportunities especially for small- and medium-sized companies in the wood processing industries both in Finland and the Baltic countries.

REFERENCES

- Akerfelds, I., 2003. The development of forest products and Industry. Latvian national programme of the forest sector and related industries. TCP/LAT/2901. <http://www.forestcluster.lv/reports.php>
- Board of Customs. 2005. <http://www.tulli.fi/en/index.jsp?language=en>
- Campbell Group. 2006. Timber trends. November 2006. http://www.campbellgroup.com/timber_research/pdf/Nov%2005%20Timbertrends.pdf
- Centre of Forest Protection and Silviculture. 2006. Fellings in 2004 and 2005. http://www.metsad.ee/aruanDED/200605%20raied_2004-2005.pdf
- Dicken, P., 1998. *Global shift: Transforming the world economy*. NY.
- EKT Group. 2004. The wood and furniture industry in Lithuania: A study of the industry's prospects.
- Enterprise Estonia. 2002. Survey of the Estonian wood processing industry. Ministry of Economic Affairs. http://www.eas.ee/vfs/2132/Puidusektori%20uuring_inglise%20keeles.doc
- FAO. 2006. Statistical database of Food and Agriculture Organization of the United Nations. <http://faostat.fao.org/>
- Finnforest. 2006. <http://www.finnforest.com/>
- Finnish Forest Research Institute. 2005. Forest information service of Finnish Forest Research Institute. <http://www.metla.fi/metinfo/index-en.htm>
- Hanzl, D. and Urban, W. 2000. Competitiveness of industry in Candidate Countries: Forest-based industries. The Vienna Institute for International Economic Studies (WIIW). http://www.wiiv.ac.at/pdf/competitiveness_forest.pdf
- Hayter, R. 2004. The dynamics of industrial location: The factory, the firm and the production system. Department of Geography, Simon Fraser University, Burnaby. http://www.sfu.ca/geography/people/faculty/Faculty_sites/RogerHayter/books.htm
- Kirsis, J., 1995. Sawwood marketing practices in Latvia. Unpublished paper presented in FAO and UN ECE timber committee workshop: Development of marketing of sawwood products in countries in transition to market economies. Tartu, Estonia. 18 p.
- Koskisen. 2006. <http://www.koskisen.com/>
- Korhonen, K., 2005. Foreign direct investment in a changing political environment: Finnish investment decisions in South Korea. Helsinki School of Economics. Serie A-265. 246 p.
- Krutainis, M., 2003. Forest sector economics report (Phase 1). Latvian national programme of the forest sector and related industries. TCP/LAT/2901. <http://www.forestcluster.lv/reports.php>
- Laasik, H., 2001a. Näpi saeveski investeerib 25 miljonit. Postimees 08.05.2005. In Estonian.
- Laasik, H., 2001b. Pärnumaal Saugal avatakse 1999 miljonit maksev saetööstus. Postimees 14.09.2005. In Estonian.
- Metsäteollisuus. 1999 – 2005. Ympäristönsuojelun vuosikirja. Saha- ja levyteollisuus. Vuoden 1998 – 2004 tilastot. <http://www.forestindustries.fi/julkaisut/vuosikirja.html>
- Ministry of Agriculture and Forestry Finland. 2005. Action plan for the Baltic 21 forest sector 2005 – 2008. Baltic 21 Series 1/2005. http://www.baltic21.org/attachments/Action_Plan_for_the_Baltic_21_Forestry_Sector_2005_08.pdf

- Mutanen, A., Viitanen, J., Toppinen, A., Hänninen, R. and Holopainen P., 2005. Forest resources, production and exports of roundwood and sawnwood from Russia. Working papers of the Finnish Forest Research Institute 9. <http://www.metla.fi/julkaisut/workingpapers/2005/mwp009.pdf>
- Nishioka, H. and Krumme G., 1973. Location conditions, factors and decisions: An evaluation of selected location surveys. *Land Economics* 49:195-205.
- Õisma, R. and Luts, A., 2003. Pressing of wood processing residues: technology and economics. B.Sc. thesis. Estonian Agricultural University, Tartu.
- Ollonqvist, P., 1998. Metsäpolitiikka ja sen tekijät. Pitkä linja 1928 – 1997. *Metsälehti Kustannus*, 301 p. In Finnish.
- Ollonqvist, P., 2000a. Puukaupan kilpailurajoitukset: Instituutiot ja niiden kehitys. In: Pajuoja, H. (ed.). *Kilpailu puu- ja vientimarkkinoilla. Metsäntutkimuslaitoksen tiedonantoja* 771:63-90. In Finnish.
- Ollonqvist, P., 2000b. Kilpailurajoitukset ja reaalisten kantohintojen kehitys vuosina 1949 – 1998. In: Pajuoja, H. (ed.). *Kilpailu puu- ja vientimarkkinoilla. Metsäntutkimuslaitoksen tiedonantoja* 771: 91-113. In Finnish.
- RMK. 2006. Selling price of timber of Estonian state forest management centre (RMK). <http://www.rmke.ee/pages.php3/02040201>
- Rozental, V., 2003a. Sylvester läks Stora Enso rüppe. Äripäev 24.12.2003. In Estonian.
- Rozental, V., 2003b. Sylvesteri omanike nutikas maksudiil. Äripäev 08.10.2003. In Estonian.
- Rozental, V., 2004a. Saetööstus tõi Imaverre uue elu. Äripäev 02.07.2004. In Estonian.
- Rozental, V., 2004b. Uus saepurutehas pingestab toormeturgu. Äripäev 21.07.2004. In Estonian.
- Selby, A. and Petäjistö, L., 2002. Small enterprises in the wood products sector of eight European countries. Finnish Forest Research Institute. *Research Papers* 839. 174 p.
- Stora Enso. 2006. <http://www.storaenso.com>
- Toppinen, A., Viitanen, J., Leskinen, P. and Toivonen, R., 2005. Dynamics of roundwood prices in Estonia, Finland and Lithuania. *Baltic Forestry* 11:88-96.
- UNECE. 2006. United Nations Economic Commission for Europe. Timber Committee Market Reports. <http://www.unece.org/trade/timber/mis/reports.htm>
- Wood Wisdom. 2002. Finnish forest cluster research programme WOOD WISDOM (1998-2001). Report 3. Tekes, Academy of Finland, Ministry of Agriculture and Forestry and Ministry of Trade and Industry. http://www.tekes.fi/julkaisut/Wood_Wisdom.pdf
- UPM-Wood. 2006. <http://w3.wisa.upm-kymmene.com/>
- Yearbook of Forest. 2005. Metsakaitse- ja metsauuenduskeskus (Centre of Forest Protection and Silviculture). Tartu. 175 p. In Estonian.

III Non-wood forest products and services

INTRODUCTION TO THE COST E30 WORKING GROUP THREE PAPERS PRESENTED AT THE VITERBO MEETING

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Main object of the Working Group 3 of the Cost Action E30 has been to analyse the conditions under which the demand of the urban population on non-wood forest products and services (NWFP&S) can be better integrated into rural supply. The focus has been in the analysis of increased opportunities for demand-driven entrepreneurship in non-wood forest products and services.

In the last meeting of the COST Action E30 held in Viterbo (Italy) the analysis of the problems and potentials of NWFP&S has been based on a comparative evaluation of the case studies presented in the Country Reports (Forest sector entrepreneurship 2005) of Phase one of the Action (see Table 1).

The comparative analysis of the cases studies has been carried out with using different criteria to reach a common understanding of the problems and potential of NWFP&S marketing related aspects (see Table 2). Looking at the main elements considered in the case studies of the Country Reports and to the background experiences of the Working Group participants, five main subjects have been selected to develop a conceptual framework for understanding the factors affecting competitiveness, the barriers and perspectives to enhance entrepreneurship and the problems and solutions for enterprise development with special reference to marketing strategies.

Accordingly to these objectives four Sub-Groups (SG) have been organised as follows¹:

- **SG 1** dealing with **NWFP&S taxonomy**, with 3 members (U. Mantau - coordinator, J. Wong and S. Curl);
- **SG 2** with the aim to monitor national experiences and to develop a common frame of **NWFP&S indicators**; 4 persons have been involved in the WG activity (K. Seeland - coordinator, S. Dragoi, M. Kalinowski and P. Stanislewsky);

¹ A fifth Sub-Group have been working for some months under the coordination of Johan Barstad (Norway) on the topic "Competence for change", i.e. the role of the interplay between the firm(s), the public and the civil society. The SG's objective was the analysis of how the quality of this interplay, the way they work together to confront external challenges, can be helping or impeding entrepreneurship.

- **SG 3** considering the role of innovation in supporting or impeding the development of **NWFP&S**; the SG was based on 7 members (G. Weiss - coordinator, L. Bouriaud, S. Martin, A. Matilainen, C. Nastase, L. Nichiforel, E. Nybakk, B. Vennesland);
- **SG 4** dealing with **NWFP&S marketing** problems with 9 members (D. Pettenella - coordinator, L. Ciccicarese, A. Hegedus, A. Hingston, S. Klöhn, S. Posavec, T. Thorfinnsson, S. Dragoi, A. Matilainen).

Table 1. Case studies related to NWFP&S presented in Phase 1 of the E30 Cost Action.

| | Products | Services |
|-------------|---|--|
| Austria | - | Nature conservation (country + FMU examples) |
| Denmark | Christmas trees and greenery (country) | Recreational activities (2 FMU) |
| Finland | Birch sap (FMU) | Bird watching (FMU) |
| France | Biodiversity protection (region) | Forest recreation (country) |
| Hungary | Mushrooms (country) | Forest recreation (FMU) |
| Iceland | Berry wine | Mushroom |
| Ireland | Christmas trees and foliage production (country) | - |
| Italy | Truffles and chestnuts (both at country and regional level) | Environmental education |
| Lithuania | Mushrooms (country and one region) | Countryside tourism (country) |
| Norway | - | Tourism (region) |
| Poland | Forest fruits and mushrooms (country) | Recreation (FMU: a landscape park) |
| Portugal | Cork Forestry based livestock production | - |
| Romania | - | CO ₂ sequestration (country) Hunting (country) |
| Switzerland | Chestnut (one region) | Alternative funerals in forests (country + 2 enterprises) |
| UK | Moss (region and 3 FMU) | Mountain biking (enterprise and region) |

FMU= Forest Management Unit

As reported in Figure 1, the activity of the four SGs has been conceptually interlinked, with SG 1 working more on general theoretical concepts, SG 3 and 4 considering

more applied aspects connected to entrepreneurship enhancement, and SG 2 dealing with systems of monitoring and evaluating the sector development.

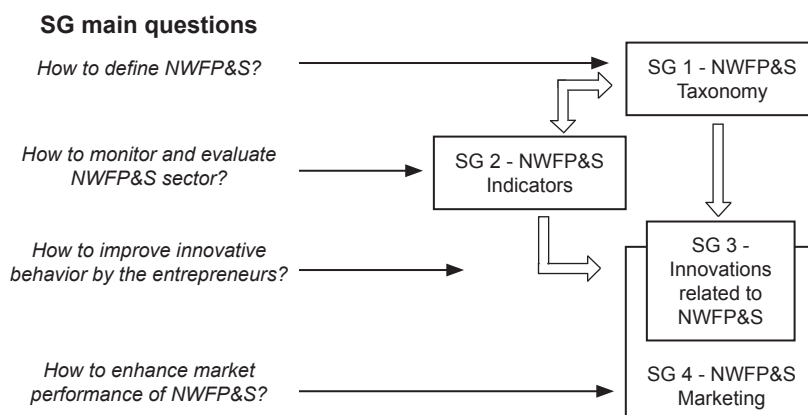


Figure 1. Conceptual framework of the Working Group on Non-wood forest products and services and links among the Sub Groups activities

Table 2. Main aspects considered in presenting NWFP&S sector in the E30 Action Country Reports.

| | Products | Services | Property rights | Marketing, Innovation | Sources of information |
|-----------------|------------------|----------------------|------------------------|------------------------------|-------------------------------|
| Austria | Y (no figures) | Y (no figures) | Y | Y | Y |
| Denmark | Y (no figures) | Y (no figures) | N | N | N |
| Finland | Y (with figures) | Y (few figures) | Y | Y | Y |
| France | Y (with figures) | Y (few figures) | N | N | N |
| Hungary | Y (few figures) | Y (few figures) | Y | Y | Y |
| Iceland | Y (no figures) | Y (no figures) | Y | Y | Y |
| Ireland | Y (no figures) | N | N | N | Y |
| Italy | Y (with figures) | Y (limited examples) | Y | Y | Y |
| Lithuania | Y (with figures) | N (only hunting) | Y | N | N |
| The Netherlands | N | Y (no figures) | N | N | N |
| Norway | Y (few figures) | Y (no figures) | Y | N | Y |
| Poland | Y (with figures) | Y (no figures) | Y | Y | Y |
| Portugal | Y (with figures) | Y (with figures) | N | N | N |
| Romania | Y (with figures) | Y (with figures) | Y | Y | Y |
| Switzerland | Y (no figures) | Y (no figures) | N | N | N |
| UK | Y (with figures) | Y (with figures) | Y | Y | Y |

In the following four papers the main results of the Sub Groups operated under the COST E30 Working Group two are reported.

REFERENCES

Jáger, L. (ed.), 2005. Forest sector entrepreneurship in Europe: Country studies. Acta Silvatica & Lignaria Hungarica. Special Edition 2005. 811 p.

TOWARDS A TAXONOMY OF FOREST GOODS AND SERVICES (FOGS)

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SUMMARY

The FAO definition of Non-Wood-Forest-Products – NWFP is presented. The inconsistencies and disadvantages of this term are discussed. Some general aspects on building “operational terms” and criteria for proper scientific definitions are given. Terms are not neutral and may have a variety of political implications. Different ways of systemizing Forest associated Resources are shown. Such systems can be built on product groups, economic properties, marketing strategies or other properties. At present, there is no satisfactory operational definition for non-wood forest products” so we present a systematic and hopefully more fruitful way of defining Forest associated Resources. Topics discussed in this paper are:

1. The FAO definition of Non-Wood-Forest-Products – NWFP
2. Problems of the FAO definition
3. Criteria for proper scientific definitions
4. A system of classifying terms for forest products
5. Systems of comparative terms of forest products

1. THE FAO DEFINITION OF NON-WOOD-FOREST-PRODUCTS – NWFP¹

The FAO defines NWFP as “products of biological origin other than wood, derived from forests, other wooded land and trees outside forests. NWFP may be gathered from the wild, or produced in forest plantations, agro forestry schemes and from trees outside forests.”

“Examples of NWFP include products used as food and food additives (edible nuts, mushrooms, fruits, herbs, spices and condiments, aromatic plants, game), fibre used in construction, furniture, clothing or utensils), resins, gums, and plant and animal products used for medicinal, cosmetic or cultural purposes.” The FAO states that many “new and practically interchangeable terms have been created:

¹ The chapter 1 is almost completely based on the FAO homepage: <http://www.fao.org/forestry/foris/webview/fop/>

by-products of forests, minor forest products, non-timber forest products, non-wood goods and benefits, non-wood goods and services, other forest products, secondary forest products, special forest products and a multitude of definitions proposed, all covering different aspects, species and products according to the focus of work of the respective author or organization. This lack of a clear terminology causes serious problems.”

“In 1995, FAO made a first step towards a harmonized definition of NWFP’s by organizing the International Expert Consultation on Non-Wood Forest Products in Yogyakarta, Indonesia. During this meeting, 120 participants from 26 countries, NGOs and UN agencies agreed on one definition of NWFP’s: „NWFP’s consist of goods of biological origin other than wood, as well as services, derived from forests and allied land uses.“

Based on the recommendations of an internal interdepartmental FAO meeting on definitions of NWFP’s held in June 1999, the following new FAO working definition of NWFP’s has been adopted: „Non-wood forest products consist of goods of biological origin other than wood, derived from forests, other wooded land and trees outside forests.“ According to this definition, slightly changed from the one adopted in 1995, the three components of the term „non-wood forest products“ are interpreted as follows:

- **Non-wood:** The term NWFP excludes all woody raw materials. Consequently, timber, chips, charcoal and fuel wood, as well as small woods used in tools, household equipment and wooden carvings are excluded. Non-timber forest products (NTFP’s), in contrast, generally include fuel wood and small woods; this is the main difference between NWFP’s and NTFP’s.
- **Forest:** NWFP’s are derived from forests and similar land uses. FAO elaborated the definitions of “forest” and “other wooded land” in a working paper for the Forest Resources Assessment of 2000. Since plantations are included in the FAO definition of forest, NWFP’s that are obtained from plantations, such as gum arabic (*Acacia Senegal*) or rubber (*Hevea brasiliensis*), are included in the definition of NWFP’s. Many NWFP’s are derived from both natural forests and forest plantations.
- **Products:** In *FAO’s proposed definition, the term “product” corresponds to goods that are tangible, physical objects of biological origin such as plants, animals and their by-products. Forest services (e.g. ecotourism, grazing,

bioprospecting) and forest benefits (e.g. soil conservation watershed protection and maintenance of biodiversity) are excluded. Intangible services and benefits are even more difficult to assess and quantify than NWFP's and have therefore been excluded from most publications dealing with NWFP's. A clear definition of forest services and benefits is still lacking.

2. PROBLEMS OF THE FAO DEFINITION

A problem of most definitions is the inherent standpoint of opposition or *non*. This stems from the inherent tendency for humans to simplify their world by dichotomising. This can lead to over simplification that is unfruitful at best.

The origins of the term NWFP is rooted in tropical forestry of the late 1980's. As extensive forest clearance for agriculture collided with a forestry ethos that emphasized the production of raw materials for the wood industry, forest-dependant environmental, economic and social problems were exacerbated. In response, alternatives to timber production were sought as viable economic and social alternatives to logging. As a consequence numerous other potential and existing products were identified. The attribute common to these resources was that harvesting them did not necessarily involve the felling of the forests. Within FAO the recognition of the social and livelihood significance of these resources was precipitated by the work by Falconer (1990) who opposed the terms "major significance" against the commonly used term 'minor forest products' to emphasise that they were overlooked. Having accepted that these resources were of importance FAO had to find somewhere within its institution to place them. In the event, political interdepartmental issues meant that it was placed in the Forest Products Division and it is here that the term NWFP evolved to identify the new branch from the traditional business of the FOP Division which, of course, was timber. [Falconer pers comm.].

So the concept "NON" was selected in opposition to previous forest management forms and to emphasis alternative possibilities of using forests. A certain "Anti" attitude is inherent in this concept. Perhaps this explains the global success of the concept. The term itself has become so deeply established that it is often considered futile to consider alternatives (Belcher 2003). This is nevertheless necessary because the term shows increasingly effects that cannot be in line with original goals of its authors.

Definitions themselves are not true or false. They are only adequate or inadequate and the FAO definition does not define the goal or purpose the definition is to serve. Therefore it is important to clarify these factors first. At one point FAO states: "Services and benefits are even more difficult to assess and quantify than NEAPs (National environmental action plans) and have therefore already been excluded from most publications dealing with NEAPs. A clear definition of forest services and benefits is still lacking." Is it adequate to consider only quantifiable, tangible products or is the purpose to open alternative income possibilities for forest enterprises? Even markets for urban carving activities are excluded from NWFP because of systematic reasons.

These and other problems occur because the target of the term NWFP was not clearly defined before the term was coined. Fuel wood and small woods are important income sources in many countries. Many species of mushrooms for example grow both in the forests and on agricultural land. Are mushrooms picked in the forest a NWFP and mushrooms picked on agricultural land not? What about mushrooms picked in a forest meadow? And how do the "NWFP-happy" statisticians differentiate between the origins of mushrooms? It is not meaningful to exclude these resources from further consideration because they are difficult to classify. The term NWFP is so inconsistent that FAO was forced to add yet another category to define other "non"-products. An alternative term, used by many foresters is Non-*Timber* Forest Products (NTFPs) and this generally includes fuel wood and small wood. This term may solve the problem of wood carving activities, but its use creates other systematic problems. For example, fuel-wood is becoming a more important resource in many countries, not only for households but for big industry as well. Is fuel wood burned in big power plants a NTFP or only fuel wood in households? The exclusion of services from NTFP is also inconsistent because today many material products cannot be sold without some service. The whole concept of NWFP is not adequate or fruitful for analyses or marketing.

Furthermore these terms are counterproductive. Just imagine a salesperson that tries to sell a Harley Davidson motorcycle with the name "Non-Four-Wheel-Driving-Machine" and because he does not like the complex „word salad“, announces it as a NFWDM. Imagine how successful they are likely to be!

There is no reason why these resources should continue to be defined by a system that is both structurally unsound and negative. These resources merit being

classified in positive terms based on their properties and markets for which they are produced. Tradition is the only apparent reason for the continued use of this term. But if it ever was, it is still meaningful to make a differentiation between wood and non-wood forest resources. The main purpose for devising a term is to facilitate communication, the grouping of similar objects so generalisations can be made and if we are concerned with livelihoods to market opportunities for forest enterprises and products. A Christmas tree is definitely a wood product in that it includes the wooden stem of the tree. However the market around the point of sale is a service combining different types of resources ranging from mistletoe branches to red deer goulash. Is the Christmas tree to be excluded while the mistletoe branches and red deer goulash are classed as NWFP? That seems illogical and does not serve any useful purpose. The product is the cultural association between Christmas and forest products which provides opportunities to earn money from a range of seasonal products.

Future environmental and social demands, will certainly redefine the role of wood production. These shifts in emphasis and the realization of the increasing importance of resources other than those based on timber, demand management plans that promote the development of sustainable use of the forest capable of embracing continuing changes in use patterns. The concept NWFP does not address this potential adequately. The negative connotations of non-wood must be replaced by a system that more fully addresses the potentials for positive change and growth that can be attributed to these resources. In order to develop a new system for forest products the scientific criteria for adequate definition must be taken into consideration.

3. CRITERIA FOR PROPER SCIENTIFIC DEFINITIONS

Carnap (1956) isolated four criteria to test the adequacy of a definition:

- **Similarity:** A term must be similar to the phenomenon that it symbolizes.
- **Exactness:** A term must exactly include the phenomenon it declares. Often a single word does not suffice to explain the phenomenon. In such cases one can use a system of terms to fulfil the criteria.
- **Fertility:** A term must be fruitful in terms of theories and conclusions that can be derived from or with it.
- **Simplicity:** A term must be “simple” as a definition, and simplify the construction of conclusions and theories.

Terms can appear in three forms:

- (1) Classifying terms: These divide phenomena in different classes (e.g. plants, animals).
- (2) Comparatives terms: These serve for the observation of comparisons (e.g.: rivalry and excludability)
- (3) Quantitative or metric terms: These are used for the classification of qualities by numerical values (e.g.: temperature, price index)

The term NWFP is a classifying term. Does the term fit these criteria?

- (1) The similarity between the term and the phenomenon in question is lacking because many areas offering product potential are not included, for example all types of services. These are definitely “non-wood” resources. If the term is meant to describe only plant and animal products, why is it not simply termed Forest Plant, Fungi and Animal Products, FPAP? This would be more similar to the phenomenon.
- (2) Obviously the FAO was not satisfied with the exactness of the first definition of the term NWFP. Furthermore, all kind of services were still excluded, forcing the addition of S for services (NWPS). Imagine if this continues for future specifications. The definition will only become more exact, by making it more complicated. Even experts have problems in understanding what is included and what is not.
- (3) The concept that presently combines various alternatives to traditional use of timber in the wood industry remains an empty term rendering it infertile to increase understanding and theory building possibilities; it must be adequate and exact. Therefore theories are applied to phenomena that are inadequate on one hand while the term is too broad to generate specific knowledge for special product areas.

Lastly the purpose of the term must be clarified. If the target is increasing income possibilities for forest land owners or other persons who utilize forest resources, then every “non-term” is counterproductive because it is negative and unspecific. For scientific progress it is simultaneously inexact and complicated.

Conclusion: It is time to banish all “non-terms” from forestry to create a scientific clarity and remove all negative connotations from forest resources giving them all equal attractiveness and presenting them as a broad variety of attractive goods and services.

4. A SYSTEM OF CLASSIFYING TERMS FOR FOREST PRODUCTS

Terms assist in classifying different phenomenon and if possible they should help to communicate purpose. The following goals are normally linked with forest resource potential:

- (1) Income possibilities for rural areas;
- (2) Diversification of forest income and market development
- (3) Endorsement of all possible forest resources.

The final goal does not necessarily exclude wood. Rather it is important to look at all of the production possibilities of a forest to determine the best choice between production goals and other pertinent factors. Therefore a new term for forest production potential should include wood as well. Besides this economic aspect, other reasons lead to the integration of wood into any new system. As mentioned previously, wood in the context of energy shortages and CO₂ issues is an increasingly ecologically significant resource. Furthermore the concept of sustainability is so broadly accepted that the contrast of wood production and forest preservation is no longer a theoretical problem although political understanding and action are still lacking. Finally all goods and services derived from forests have their foundations in trees. This does not however mean that their utilization requires the harvesting of trees. A terminology for forest products that excludes its own basis is not convincing.

The variety of forest products is so diverse, that one term cannot cover all aspects. Thus a new open system of terms for forest dependent resources is proposed. The FOGS-system systemizes all forest associated goods (commodities) and services.

“FOrest Goods and Services are of resources of biological origin, associated with forests, other wooded land and trees outside forests.”

Definitions of **forests**, woodlands and trees outside the forest are not given in this paper. There are hundreds of definitions of forests and woodlands. Lund (2002) found 179 societal definitions, 27 international definitions and 349 legal definitions, for a total of 555 definitions of the word ‘forest’ alone. It is likely that a search for ‘and trees outside forests’ would produce similar results. Therefore any definition of these words put forth in this paper would be unsatisfactory to some readers. It is therefore left to the reader to use this text as it pertains to the society, country or international group within which they work. However, since it was decided to use *forests, woodlands and*

trees outside forests in the working definition, every possibility has been covered and specific definitions of forests or wooded land and trees are not necessary.

However, the term **forest associated** should be defined in this context. Forest associated resources are those resources utilized for the production of goods and services that are either biologically dependant upon forest, or those for which the imagery of forests is an integral facet of their marketing. Examples of biological dependence are numerous. However it is important to bear in mind that these resources need not be restricted to forests, however forest environments are necessary for some aspects of their existence. For example, while deer often range outside forests for browsing, they are none the less dependent on forests for shelter.

The second set of resources in this classification are those for which the imagery of forest is integral to the marketing. These are typically goods that have been traditionally harvested from forest ecosystems. While not all of these resources are strictly biologically bound to forest ecosystems, cognitively they remain tied to the forest. Several species of mushrooms and berries can be raised outside forest environments.

Services such as various recreational pursuits can be performed outside the forest environment, such as mountain biking and camping trips. However in both of the cases mentioned, their association with the forest is a major aspect of their desirability thereby providing a decisive market advantage for these goods and services.

Considering the vast differences in cognitive and therefore marketing strategies from one culture to the next, it is fruitless to expect these categories to remain constant on a pan European or global basis. Mountain biking is for example closely associated with forests in the British Isles. In Iceland however, mountain biking is associated rather with treeless landscapes. It is futile to expect all resources classified as forest associated to remain constant from culture to culture. However the use of the word associated to define forest associated goods and services provide the basis and flexibility necessary to deal with these types of resources in a meaningful manner.

- **A resource** in the context of forest is a source of anything naturally occurring and of use to humans that may be drawn upon when needed.²
- **An output** is anything made from a resource (and can be a good or service).

² wordnet.princeton.edu/perl/webwn; www.geographic.org/glossary.html; 01.01.06

- **A good** is any separate entity made from a resource capable of being stored and delivered to a purchaser.
- **A product** is anything that can be offered to a market that might satisfy a want or need. A product can be a simple good (fuel wood) or a complicated mixture of goods and services (Christmas tree market).
- **Services** are heterogeneous outputs produced to order and typically consist of changes in condition of the consuming units realized by activities of the producer at the demand of the customer and are produced and consumed at the same time. (**Services** are not separate entities and cannot be traded separately from the forest to which they are attached) (United Nations European Commission 2002).
- **A user** is any person or organisation having benefit or fulfilling any need with or without payment.
- **A client** is a user who pays for a product or a service.

Three basic levels of definition for forest products are considered. Each level may be divided into several sublevels.

Definition level 1 (resource):

1. A **resource** is the basis for any output.

Resources for **goods** are (energy, carbon, land, water, material, plants, foodstuff, fibre, medicine, extractives, live, other).

Foodstuff a good and can have the sublevels like plants, trees and seeds.

Resources for **services** are personal, recreation, social, environmental, other.

Recreation can have the sublevel cycling and underneath leisure cycling, cycle touring, road cycling and mountain biking.

Definition level 2 (product):

2. A **product** is a marketable good or service or combination of both.

Products made of a good like „seeds“ are (animals, plants, seeds, bulbs).

Seeds can have the sublevels tree seeds, flower seeds, herbal seeds and others.

Tree seeds will obviously have further sublevels by species.

Products made of a services like „cycling“ are bridle paths, forest roads, footpaths, open access and can be divided into sublevels.

Products made of goods and services are Christmas tree markets, guided tours with shopping and/or catering and can be divided into sublevels.

Definition level 3 (user):

3. A **user** is a target group of people who may benefit of a product and may pay for it (client). This level describes the market specialities for a given product. Users of goods are households buying branches. Users can be directly or from one or several intermediaries like wholesaler and retailer (market garden).

These three levels (resource, product and user) are the basic classification scheme of Forest Goods and Services (FOGS). Each level can be subdivided into further levels if it makes sense in terms of analyses or marketing.

It serves the three targets:

- (1) Income possibilities for rural areas;
- (2) Diversification of forest income and market development;
- (3) Endorsement of all possible forest resources.

Because the classification points out, that resources are not enough. Products have to be shaped. However, products have to be successful on markets. Thus the user is included. This guarantees that forest resources are looked at from the market point of view as well.

Where to put species in these three categories? For a forest product classification of species can become a very important issue. It depends on the importance of species for the specific target. If species are just another product version it can be included on resource or product level, when species makes a difference concerning analysis or marketing. If species are the main issue then the classification of resources, products and users can be defined for the relevant species one by one, which means a complete matrix for one species. The same can be done for regions or other categories which might be of interest. However, resources, product and user remain as the core categories of the taxonomy.

Table 1. Example of the forest products taxonomy (FOGS).

| GOODS | | |
|------------------|-----------------------------|-----------------|
| Resources | Products | Users |
| 1,5 Foodstuff | 2,1 Production process nuts | 3,1 Producer |
| 1,51 Plants | pure harvested | Farmer |
| 1,52 Trees | peeled | Co-operative |
| 1,53 Seeds | roasted | Industry |
| 1,54 Nuts | salted | |
| 1,541 Hazelnut | dried | 3,2 Distributer |
| 1,542 Almond | | Wholesaler |
| 1,543 Brazil nut | 2,2 Marketing process nuts | Retailer |
| 1,544 Pistachio | canned | |
| 1,545 Coconut | bag | 3,3 Consumer |
| 1,546 Chestnut | loose | Single |
| 1,547 Walnut | | Household |
| | | Restaurant |

The real world is much more complicated, than any system of terms can cover. Very often combinations of products are bundled together as a matter of convenience. The possibility of combinations is unlimited. This problem occurs in almost any statistic. For example the NACE-systematic for economic sectors assigns an enterprise to the sector with the highest net production. A sawmill for example that produces stairways will remain sawmill as long as the net product of that sawmill is higher than 50 % of the net product of the enterprise. For a product system the costs instead of the net production may be the relevant criteria for the assignment. As the term **product** is anything that can be offered to a market the approached market (end consumer) should be classification category. For example, if the classification is done by cost in case of a wood carving it belongs to “logs” as long as the cost of wood is higher then the cost of labour. Therefore the level 6 (end consumer) is very often needed to make an adequate classification, because the carving should be better included in material aesthetic products then in logs even though the raw material may still have a higher value.

5. SYSTEMS OF COMPARATIVE TERMS OF FOREST PRODUCTS

Comparatives terms serve for the observation of comparisons (e.g.: rivalry and excludability). They are helpful to understand product development processes, marketing strategies, economic structure and many other aspects of products.

The flowing determination between public and private goods is very relevant for questions of product transformation. Mantau (1994, p. 308-313) developed a matrix

which contains four fields with different implications for a marketing strategy³. He uses the performance characteristics exclusion possibility and rivalry as criteria to define certain product types and points out that these performance characteristics are not fix but changeable over time and by marketing strategy. This model is presented in the following figure in a simplified version:

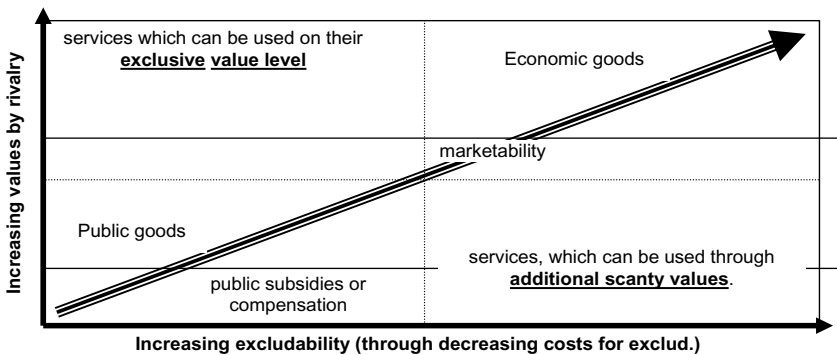


Figure 1. Continuous structure of goods and strategy fields for public goods⁴.

A stratification of cases according to the offering enterprises in the RES-project lead to a systematic which combines market structures resulting from product- and demand features, offers complex opportunities of comparative description. The typology of products was enlarged by the dimension „number of offerors“. Combined with the division into the eight categories of immateriality and customer integration, the following “typology of offers“.

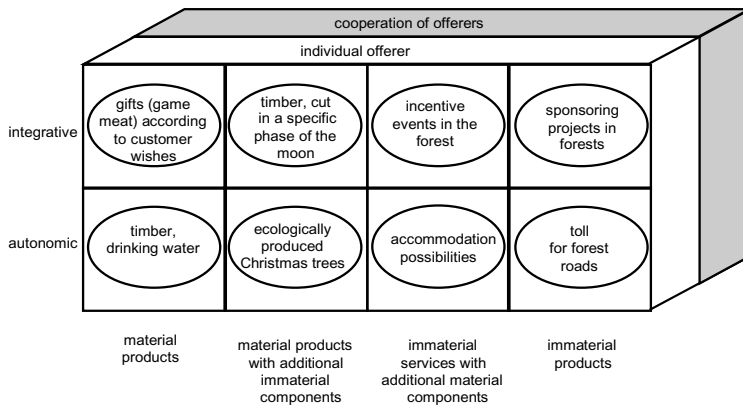


Figure 2. Typology of offers (Welcker and Mertens 2002).

³ Compare also product-matrix at Glück (1995)

⁴ Figure modified according to Mantau (1994, p. 311; 1995a, p. 143; 1997a, p. 270)

The dimension “cooperation of offerors” was chosen as an important dimension for the categorization, because it is an important difference whether a single forest enterprise offers a product or if a cooperation does. In case a cooperation offers certain products, there are always organization costs within this organization, which have to be added to the transaction costs and, therefore, the total amount of coordination costs increases.

The two described comparative terms are just examples for setting up comparative terms in order to serve analysis or marketing targets. Depending on the analysis or marketing target unlimited comparative terms can be developed. Their value is higher the better they help to analyse or to sell

REFERENCES

- Belcher, B., 2003. What isn't a NTFP? *International Forestry Review* 5(2):161-167.
- Carnap, R., 1956. The methodological character of theoretical concepts. In: Feigl, H. and Scriven M. (eds.). *Minnesota studies in the philosophy of science*. Minneapolis. Cited by Stegmüller W. *Hauptströmungen der Gegenwartsphilosophie*, Vol. I:373-375
- Glück, P., 1995. Vermarktung forstlicher Dienstleistungen. *Internationaler Holzmarkt* 3(95):18-21
- Falconer, J., 1990. The major significance of 'minor' forest products: The local use and value of forests in the West African humid forest zone. *FAO, Community Forestry Notes*.
- Lund, H.G., 2002. Coming to terms with politicians and definitions. In: Dobbertin, M.K. and Prüller, R. (eds.). *Forest terminology: Living expert knowledge – how to get society to understand forest terminology*. IUFRO Occasional Paper 14: 23-44.
- Mantau, U., 1994. Produktstrategien für kollektive Umweltgüter – Marktfähigkeit der Infrastrukturleistungen des Waldes. *Zeitschrift für Umweltpolitik und Umweltrecht*. 3(94):305-322.
- United Nations European Commission. 2002. *Manual on statistics of international trade in services*. Statistical papers, Series M. 86:7-8.
- Welcker, B. and Mertens, B. 2002. Product typology for marketing and contracting analysis. In: Mantau, U., Sekot, W., Merlo, M., and Welcker, B., *Recreational and environmental markets for forest enterprises: A new approach towards marketability of public goods*. Pp. 135-142.

Box 1. Additional readings on Forest Goods and Services:

- Bellefontaine, R., Petot, S. Pain-Orchet, Delleport, P. And Bertault, J.-G., 2002. Trees outside forests: Towards better awareness. FAO Conservation Guide 35. Rome.
- Boom B.M., 1989. Use of plant resources by the Chacobo. In: Resource management in Amazonia: Indigenous and folk strategies. Posey D.A. & Balee W. (eds). Advances in Economic Botany 7. Pp. 78-96.
- Chandrasekharan, C., 1995. Terminology, definition and classification of forest products other than wood. In: Report of the International expert consultation on non-wood forest products. Yogyakarta, Indonesia. 17-27 January 1995. Non-wood forest products no. 3. FAO, Rome. Pp. 345-380.
- Edwards, I., 1991. Quantitative ethnobotanical survey of a hectare of tropical forest near Toraut, Dumogo Bone National Park, Northern Sulawesi, Indonesia. Sulawesi Ethnobotanical Project. Preliminary Report. 8 p.
- FAO. 2005. Proceedings: Third expert meeting on harmonizing forest-related definitions for use by various stakeholders. Rome, 17-19 January 2005. FAO, Rome.
- Fitzgibbon, C.D., Mogaka, H. and Fanshawe, J.H., 1995. Subsistence hunting in Arabuko-Sokoke Forest, Kenya, and its effects on mammal populations. Conservation Biology 9 (5):1116-1126.
- Kleinn, C., Laamanen, R. and Malla, S.B., 1996. Integrating the assessment of non-wood forest products into the forest inventory of a large area: Experiences from Nepal. In: Domestication and commercialization of non-timber forest products in agroforestry systems. Proceedings of an International Conference held in Nairobi. FAO. Pp. 23-31.
- Lahm, S.A., 1993. Utilization of forest resources and local variation of wildlife populations in northeastern Gabon. In: Tropical forests, people and food. MAB Series Volume 13. Pp. 213-226.
- Loupe, D. and Pain-Orchet, M., 2002. Trees outside forests: definition and taking account. In: Sadio S., Kleinn C. and Michaelsen T. (eds.). Proceedings: Expert consultation on enhancing the contribution of trees outside forests to sustainable livelihoods. Rome 26-28 November 2001. Rome. Pp 58-64.
- Köhl, M., 2005. Reporting on non-wood goods and services under the MCPFE's Improved Pan-European Indicators for Sustainable Forest Management. UNECE.
- Malhotra, K.C., Poffenberger, M., Bhattacharya, A. and Dev, D., 1991. Rapid appraisal methodology trials in Southwest Bengal: Assessing natural forest regeneration patterns and non-wood forest product harvesting practice. Forest, Trees and People Newsletter 15/16:18-25.
- Mantau, U., Sekot, W., Merlo, M., and Welcker, B., 2001. Recreational and environmental markets for forest enterprises: A new approach towards marketability of public goods. Wallingford: CABI Publishing. 541 p.
- Mantau, U., Mertens, B., Welcker, B. and Malzburg, B., 2001. Beiträge zur Vermarktung der Umwelt- und Erholungsleistungen des Waldes, Sonderveröffentlichung der AFZ, Hrsg. Mantau, U., AFZ Der Wald. 106 p.
- Mertens, B., 2000. Absatzwege und Vertragskonzepte für forstliche Umwelt- und Erholungsprodukte. In: Sozialwissenschaftliche Schriften zur Forst- und Holzwirtschaft. Hrsg. U. Mantau. Bern: Peter Lang, 364 p. Vol.1.
- Prance, G.T., Balée, W., Boom, B.M. and Carbeuri, R.L., 1987. Quantitative ethnobotany and the case for conservation in Amazonia. Conservation Biology 1(4):296-310.
- Salick, J., Mejia, A. and Anderson, T., 1995. Non-timber forest products integrated with natural forest management, Rio San Juan, Nicaragua. Ecological Applications 5(4):878-895.
- Valkenburg, J.L.C.H van. 1997. Non-timber forest products of East Kalimantan. Potentials for sustainable forest use. Tropenbos Series 16. Tropenbos Foundation. 202 p.
- Welcker, B. 2001. Marketing für Umwelt- und Erholungsprodukte der Forstwirtschaft. In: Sozialwissenschaftliche Schriften zur Forst- und Holzwirtschaft, Hrsg. Mantau, U., Frankfurt (Peter Lang GmbH, Europäischer Verlag der Wissenschaften). 431 p. Vol. 2.
- Wiersum, K.F., 1999. Understanding diversity in NTFP management: A neglected issue in NTFP research. In: NTFP research in the Tropenbos programme: Results and perspectives. Tropenbos Foundation, Wageningen, the Netherlands.
- Wong J. and Hall J.B., 2004. Silviculture: Managing for Tropical Non-timber Forest Products. In: Burley J., Evans J. and Youngquist J. (eds.). Encyclopedia of Forest Sciences. Elsevier. Pp. 1066-1073.
- Wong J.L.G., 2000. The biometrics of non-timber forest product resource assessment: A review of current methodology. Report of project ZF007 for Forest Research Programme, DFID. <http://www.etfrn.org/etfrn/workshop/ntfp/index.html>
- Wyatt N.L., 1991. A methodology for the evaluation of non-timber forest resources. Case study: the forest reserves of southern Ghana. MSc thesis, Silsoe College, Cranfield Institute of Technology. 102 p.

INDICATORS FOR AN EUROPEAN CROSS-COUNTRY ASSESSMENT OF NON-TIMBER FOREST PRODUCTS & SERVICES

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SUMMARY

The study task was aimed to produce an overview of selected qualitative indicators with fragmentary data available through COST Action E30 phase one country reports (Jagér 2005). A preliminary set of first and second class of indicators to help the comparison and classification of non-timber forest products and services is suggested with some empirical testing in 14 respectively 17 European countries.

1. INTRODUCTION

According to the OECD (1993) indicators are defined such as: "They reduce the number of measurements and parameters which normally would be required to give an "exact" presentation of a situation. As a consequence, the size of a set of indicators and the amount of detailed information included in them, need to be limited. A set with a large number of indicators will tend to clutter the overview. Too few indicators, on the other hand, may be insufficient to provide the necessary relevant information. In addition, methodological problems related to weighting tend to become greater with an increasing level of aggregation. Aggregated indicators simplify the communication process by which the information of results of measurement is provided to the user. Due to this simplification and adaptation to user needs, indicators may not always meet strict scientific demands to demonstrate causal chains. Indicators should therefore be regarded as expression of "the best knowledge available".

To make the specific importance and role of non-timber forest products and services (NTFP&S) comparable among European countries of different economic structure, environmental and forest legislation and history, it was decided within the Working Group three of the COST Action E 30 to establish a sub-group in order to deal with the formulation of national indicators of NTFP&S. The study task was to produce an overview of selected qualitative indicators with fragmentary data available through COST Action E30 country reports (Jagér 2005).

2. FIRST SET OF INDICATORS

The purpose of defining the national indicators of NTFP&S indicators was comparison as well as classification through a country-wise assessment of a **first set** of indicators. This classification started with listing products which are traditionally collected or, if they are services, which are rendered by forest enterprises or individuals to society. Traditional products were looked at in detail as whether their importance increases, decreases or remains constant. Other indicators, such as whether it is a trend product, a main product as far as quantity is concerned, a rare and highly valued product (e.g. truffles) or whether it is relevant for the export sector were defined. Services were treated separately as well as questions of access and finally, and main current problems with NTFP&S were addressed in an additional section.

Legal considerations such as ownership rights and customary law were taken into account as well as disputes and conflicts over entitlements to benefits from NTFP&S. As mostly products are referred to in the matrix (Annex 2), it has to be stressed that there are also services in most of the surveyed countries which are rarely well documented and data are not readily available at the national level, if at all.

All data used in the matrix have been taken from the country reports of COST Action E30 phase one (Jagér 2005) that were produced by the representatives of each participating country in the Action. A more in depth investigation and compilation of primary data would certainly have produced more and perhaps more reliable data, but this was beyond the time and working capacity of all researchers involved in this task. It is essential to mention in this context that despite the often lacking data at the national level there is often a considerable range of NTFP&S at the regional and quite often at the local level which could not be recorded. The items and indicators in this matrix were classified according to their sheer occurrence in the mentioned country reports and their quantification had to be left aside.

Although it would have been desirable to have a quantitative data basis for reasons of comparability and for an assessment of their economic importance, it was highly doubtful if this task would be possible at all or deserve the efforts connected with data compilation. In countries, for instance, where open access to NTFP is guaranteed by law to everybody, irrespective whether they are harvested in private or public forests, quantitative harvesting records are not made, because they would make no sense. The same applies to countries where access to NTFP is restricted,

although it makes a big difference for the forest owners whether they these products are harvested in private or public forests.

3. SECOND SET OF INDICATORS

The **second set** of indicators was selected according to the assumption that they are applicable and relevant in each of the surveyed countries. Five indicators were chosen in order to make NTFP&S comparable:

- **Significance:** gives an overall assessment whether this NTFP or NTFS is important in the general national context of forest use.
- **Monetary benefit:** denotes whether there is a substantial cash flow connected to the goods or services provided.
- **Disputed:** indicates whether goods or services are disputed among certain stakeholders or whether they are contested domains in public discourse in a country in general.
- **Job relevance:** gives information whether the goods or services make up a substantial part of employment in the rural sector.
- **Access for private or public use:** indicates whether there are regulations for the collection of NTFP or property rights over them.

4. DISCUSSION

A critical look at the table of indicators attached to this introduction (Annex 2 and 3) shows that it is almost impossible to take regional and local variations concerning the importance of indicators into account within a country. NTFP&S are relevant, according to certain regions and the social strata of the society that deal with them, for predominantly rural livelihoods as well as for urban citizens and their specific lifestyle demands.

As very little empirical research has been done on rural supply and urban demand of NTFP&S (Kilchling et al. forthcoming) at the European or national level, more scientific work has to be done to analyse their role and economic potential for the future of the forestry sector and rural development in general. A market survey of urban consumers' demands could lead to a diversification in the structure of rural forest enterprises and a pro-active market strategy to promote new products and services.

Will big, medium or small forest enterprises take the lead in marketing new non-wood forest products and services? What structural changes in the forest sector are needed to promote non-wood products and services, and what strategies are adequate to achieve value additions for non-wood forest products and services to compensate rather high wage levels involved? These questions, for example, can only be answered by comparative in depth case studies among countries in which products and services have a somehow similar importance and a comparable economic stage of development. For the time being, however, we are not in a position to go beyond the qualitative assessment of NTFP&S shown in this cross-national survey.

REFERENCES

- Jáger, L. (ed.), 2005. Forest sector entrepreneurship in Europe: Country studies. Acta Silvatica & Lignaria Hungarica. Special Edition 2005. 811 p. ISSN 1786-691X (Print), ISBN 1787-064X (Online). http://www.joensuu.fi/coste30/ASLG_2005.htm
- Kilchling, P., Hansmann, R., Berger, T. and Seeland, K., (submitted). Das Nachfragepotential der urbanen Bevölkerung nach Nicht-Holz Waldprodukten in der Schweiz. Schweizerische Zeitschrift für Forstwesen.
- OECD, 1993. OECD core set of indicators for environmental performance reviews. Environment Monographs no.83. Paris: OECD, 35 p.

ANNEX 1

Compilation of publications related to NTFP&S in the COST Action E 30 country reports (Jagér 2005):

Austria

UNECE/FAO 2004: Forest Legislation in Europe: How 23 Countries approach the obligation to reforest, public access and use of NON-Wood forest products.

Bulgaria

Chobanova, R., and Niskanen, A, (eds.). 2005. Challenges for enterprise development in forestry wood processing and non wood products and services – Seminar overview. *Economic research* 1:3-10.

Kostov, P., Enchev, E., 1987. Non-wood forest products use. Zemizdat, Sofia.

Denmark

Dubgaard, A., 1998. Economic valuation of recreational benefits from Danish forests. In: Dabbert, S., Dubgaard, A., Slangen, L. and Whitby, M. (eds.). *The economics of landscape and wildlife conservation*. CAB International, Wallingford. Pp. 53-64.

Helles, F., Meilby, H., Strange, N. and Thorsen, B.J., 2002. Determinants of the price of hunting rentals. In: Helles, F. and Strange, N. (eds.). *Proceedings of the Biennial Meeting of Scandinavian Society of Forest Economics*. Gilleleje, Denmark, May 21-25 2002. *Scandinavian Forest Economics* 39:42-51.

Finland

Kangas, K., 2001. Commercial wild berry picking as a source of income in northern and eastern Finland. *Journal of Forest Economics* 7(1):35-68.

Saarinen, J., 2003. The regional economics of tourism in Northern Finland: the socio-economic implications of recent tourism development and future possibilities for regional development. *Scandinavian Journal of Hospitality and Tourism* 3(2):91-113.

Saastamoinen, O., 1982. Economics of the multiple-use forestry in the Saariselkä fell area. *Communications Instituti Forestalis Fenniae* 104. 102 p.

Germany

Mijacz, A., 2000. Sonstige Einkommensmöglichkeiten gemischter land- und forstwirtschaftlicher Betriebe im Südschwarzwald. Diplomarbeit Forstwissenschaftliche Fakultät Freiburg.

Mantau, U., Sekot, W., Merlo, M. and Welcker, B., 2002. Recreational and environmental markets for forest enterprises: a new approach towards marketability of public goods. Wallingford: CABI Publishing. 541 p.

Mantau, U., Mertens, B., Welcker, B. and Malzburg, B., 2001. Beiträge zur Vermarktung der Umwelt- und Erholungsleistungen des Waldes, Sonderveröffentlichung der AFZ, Hrsg. Mantau, U., AFZ Der Wald. 106 p.

Welcker, B., 2001. Marketing für Umwelt- und Erholungsprodukte der Forstwirtschaft. In: Sozialwissenschaftliche Schriften zur Forst- und Holzwirtschaft, Hrsg. Mantau,

U., Frankfurt (Peter Lang GmbH, Europäischer Verlag der Wissenschaften). 431 p.

Mertens, B., 2000. Absatzwege und Vertragskonzepte für forstliche Umwelt- und Erholungsprodukte. In: Sozialwissenschaftliche Schriften zur Forst- und Holzwirtschaft. Hrsg. U. Mantau. Bern: Peter Lang. 364 p.

Hungary:

Hegedüs A. and Szentesi Z., 1999. Importance of non-wood forest products in Hungary.- Study report. University of Sopron, Hungary.

Hegedüs A. and Szentesi Z., 2000. Economic importance of non-wood forest products in Hungary. FAO Rome, Non-Wood News 7. 51 p.

Hegedüs A. 2000. Channels of marketing and channels of delivery, including e-business prospects cases-practical examples from Hungary. International Workshop on Sustainable Development of Marketing of Non-Wood Forest Products in Countries in Transition to Market Economies. Chisinau, Moldova.

Hegedüs A. and Szentesi Z., 2000. Non-Wood Forest Products in Hungary. State Forest Service. Sopron, Hungary.

Hegedüs A., 2002. Modelling of Marketing Channels in Wild Edible Fungi (WEF) Business in Hungary. In: Management and Modelling Multifunctional Forest Enterprises and Properties. Proceedings of the IUFRO International Symposium, Sopron. Pp.93-94.

Hegedüs A., 2002. Assistance of utilization of non-wood forest products in Hungary. National Forest Strategy and Forest Program. White Book. Pp. 60-61.

Ireland

Collier, P.I. and Dorgan, J. 2004. Markets for non-wood forest products. COFORD, Dublin, Ireland. 84 p.

Hendrick, E. (ed.). 2002. The report on Christmas tree research. COFORD, Dublin, Ireland. 30p.

Italy

Breisch, H., 1993. Harvest, storage and processing of chestnuts in France and Italy. In: Antognozzi, E. (ed.). International congress on chestnut. Spoleto, Italy. Pp 429-436.

FAO. 1995. Edible nuts. Non-wood forest products for rural income and sustainable forestry. N.5, UN Food and Agriculture Organisation, Rome.

FAO. 2001. Non-wood forest products from broadleaf forests. FAO NWFP Series, Rome.

Pettenella, D., 2001. Marketing Perspectives and Instruments for Chestnut Products and Services. Forest Snow and Landscape Research 76 (3).

The Netherlands

Filius, A.M., 1996. Integrated Forest Management: The Old Wine of Multiple Use Management in a New Skin? Journal of Forest Economics 2(3):203-204.

Poland

Kalinowski, M., 1998. Non-Wood Forest Products in Poland. EFI Proceedings 23:87-92.

- Kalinowski, M., and Rzadkowski S., 2001. Harvesting of non-wood forest products in Poland and their resources. Seminar Proceedings. Menemen-Izmir, Turkey 2-8 October 2000. FAO. Rome.
- Staniszewski P. and Oktaba J., 2000. Current Trends of Changes in the Utilisation of Non-Wood Forest Goods and Benefits in Poland. Harvesting of Non-Wood Forest Products. Menemen-Izmir.
- Lintu L., 1998. Development Issues Related to the Marketing of Non-Wood Forest Products. EFI Proceedings 23:179-187.
- Saastamoinen, O. 1998. Non- wood goods and benefits of boreal forests: Concepts and issues. EFI Proceedings 23:219-225.

Portugal

- Mendes, A.M.S.C., 2005. Cork production and manufacturing in Portugal from the mid of the XIX th century to the end of the XX th century. Paper presented at the International Congress "Cork Plantations, factories and traders. The past, present and future of the cork business", Palafrugell – Girona (Spain), 16-18 February.

Romania

- Blujdea, V. and Dragoi, S., 2000. General overview on the forest products and services in Romania. Proceedings of the Seminar on Valuation of Forest Goods and Services, Opocno, Czech Republic, 19-21 Nov.
- Dragoi, S., 2003. Socio-economic analysis of the supply and demand on forest products. Forest Research and Management Planning. Internal report 110 p. Unpublished.
- Dragoi, S.a and Parnuta, G., 2000. Statement on non-wood forest products in Romania. Proceedings of the international workshop on Sustainable development of NWFP in countries in transition to the market economy. Chisinau, 23-27 Oct.

Switzerland

- Alfter, P., 1998. Recherche sur les biens et services non-bois de la forêt suisse: Quantification et essai de valorisation dans le cadre d'un projet de l'OFEPF. Schweizerische Zeitschrift für Forstwesen 149:87-104.
- Alfter, P., 2004. Biens non-bois et services de la forêt Suisse: Mise à jour partielle des données. Ingénieur forestier diplômé EPF-Z / CRIFOR, Fresens / NE. 24 p.
- SAEFL (eds.) 1997. Bewertung und Honorierung von Waldleistungen (VAFOR): Orientierungshilfe. Umwelt-Materialien 64. Swiss Agency for the Environment, Forests and Landscape (SAEFL), Bern. 52 p.
- Berger, T. and Seeland, K., 2004. Actual market of non-wood forest products and services in Switzerland - an internal survey of the Chair of Forest policy and Economics ETHZ.
- Bürgi, M. and Stuber, M., 2003. Agrarische Waldnutzungen in der Schweiz 1800-1950: Waldfeldbau, Waldfrüchte und Harz. Schweizerische Zeitschrift für Forstwesen. 154(9):360-375.
- Conedera, M., 1996. Die Kastanie: Der Brotbaum. Bündnerwald 6:28-47.
- Conedera, M., Jermini, M., Sassella, A. and Sieber, T.N., 2004. Ernte, Behandlung und Konservierung von Kastanienfrüchten. WSL Swiss Federal Institute for Forest, Snow and Landscape Research, Sottostazione Sud delle Alpi, Switzerland, Bellinzona. 27 p.

- FAO. 2001. Inventory of chestnut research, germplasm and references. Food and Agriculture Organisation of the United Nations, Rome, Italy.
- Stuber, M. and Bürgi, M., 2001. Agrarische Waldnutzungen in der Schweiz 1800-1950: Waldweide, Waldheu, Nadel- und Laubfutter. Schweizerische Zeitschrift für Forstwesen 152(12):490-508.
- Stuber, M. and Bürgi, M., 2002. Agrarische Waldnutzungen in der Schweiz 1800-1950: Nadel- und Laubstreu. Schweizerische Zeitschrift für Forstwesen 153(10):397-410.

United Kingdom

- Hall M. and Page S., 2002. The geography of tourism and recreation: environment, place and space. Second Edition, Routledge, London.
- Lawrence A., 2003. No forest without timber? International Forestry Review 5(2):87-96.
- Martin S. (forthcoming). Leisure landscape: Understanding the role of forest and woodlands in the tourism sector. Forest Research, Edinburgh.
- Murray M. and Simcox, H., 2003. Use of wild living resources in the United Kingdom – A review. UK Committee for IUCN.
- Prendergast H.D.V. and Sanderson H., 2004. Britain's wild harvest. Royal Botanic Gardens, Kew.
- Reforsting Scotland. 2004. Making a livelihood from plants, animal and woods in Scotland.
- Sanderson H. and Prendergast H.D.V., 2002. Commercial uses of wild and traditionally managed plants in England and Scotland. Royal Botanic Gardens, Kew.

Turkey

- Kayacan B., 2004. Economic impact analysis of forest-related goods and services (Orman kaynaklarına ilişkin mal ve hizmetler kapsamında ekonomik etki çözümlemesi), unpublished Ph.D. thesis, Istanbul University Graduate Institute of Sciences, 220 p.
- Türker, M. F, Pak. M. and Öztürk, A., 2003. The review of non-wood forest products management in Turkey from the point of five year development plans and Forestry main plans.

ANNEX 2

| AUSTRIA Indicators → Products / services ↓ | Significant Importance | Monetary | Disputable | Job-relevant | Legal access for: | |
|--|---------------------------|----------|------------|--------------|----------------------|---------------------|
| | | | | | private use | commer- cial use |
| Berries / fruits | N | Y | N | N | Y | Y |
| Mushrooms | N | Y | N | N | Y | Y |
| Nuts | | | | | | |
| Honey | N | | N | | | |
| Other edible goods | | | | | | |
| Medicinal plants | N | | | | | |
| Resin | N | | | | | |
| Bark (incl. cork) | N | | | | | |
| Foliage | N | | | | | |
| Other commercial plants | | | | | | |
| Grazing | N | | | | | |
| Hunting | Y | Y | Y* | Y | | |
| Tourism / recreation | Y | Y | Y* | Y | | |
| Education | Y | | N | Y | | |
| Nature conservation | Y | | Y* | | | |
| Heating energy | Y | Y | Y | Y | | |
| Remarks: *Conflicts between timber production and hunting (game management); sometimes: conflicts between timber production and tourism. Mushrooms, berries only partly marketed; water management and protection against natural hazards not marketed; general remark: currently - services are much more important than NW products (NT: wood chips for energy production has growing importance) (also reg. hunting - the service aspect is more important than the product aspect) | | | | | | |

| BULGARIA Indicators → Products / services ↓ | Significant Importance | Monetary | Disputable | Job-relevant | Legal access for: | |
|---|---------------------------|----------|------------|--------------|----------------------|---------------------|
| | | | | | private use | commer- cial use |
| Berries / fruits | Y | Y | N | Y | Y | Y |
| Mushrooms | Y | Y | N | Y | Y | Y |
| Nuts | | | | | | |
| Honey | | | | | | |
| Other edible goods | | | | | | |
| Medicinal plants | Y | Y | N | Y | Y | Y |
| Resin | N | | | | | |
| Bark (incl. cork) | N | | | | | |
| Foliage | | | | | | |
| Other commercial plants | | | | | | |
| Grazing | Y | | | | | |
| Hunting | Y | Y | Y* | Y | | |
| Tourism / recreation | Y | N? | | | | |
| Education | | | | | | |
| Nature conservation | Y | | | | | |
| Heating energy | | | | | | |
| Remarks: *Illegal grazing | | | | | | |

| DENMARK | | Indicators → Products / services ↓ | Significant Importance | Monetary | Disputable | Job-relevant | Legal access for: | |
|---------------------------|--|---------------------------------------|---------------------------|----------|------------|--------------|----------------------|---------------------|
| | | | | | | | private use | commer- cial use |
| | | Berries / fruits | N | | | | | |
| | | Mushrooms | N | | | | | |
| | | Nuts | N | | | | | |
| | | Honey | N | | | | | |
| | | Other edible goods | N | | | | | |
| | | Medicinal plants | N | | | | | |
| | | Resin | N | | | | | |
| | | Bark (incl. cork) | N | | | | | |
| | | Foliage | | | | | | |
| | | Other commercial plants | Y* | Y | | Y | | |
| | | Grazing | N | | | | | |
| | | Hunting | N | | | | | |
| | | Tourism / recreation | Y | Y | | Y | | |
| | | Education | Y | Y | | | | |
| | | Nature conservation | Y | N | | | | |
| | | Heating energy | N | | | | | |
| Remarks: *Christmas trees | | | | | | | | |

| CROATIA | | Indicators → Products / services ↓ | Significant Importance | Monetary | Disputable | Job-relevant | Legal access for: | |
|------------------|--|---------------------------------------|---------------------------|----------|------------|--------------|----------------------|---------------------|
| | | | | | | | private use | commer- cial use |
| | | Berries / fruits | Y | ? | N | N | Y | Y |
| | | Mushrooms | Y | Y | N | Y | Y | Y |
| | | Nuts | Y | Y | N | Y? | | |
| | | Honey | Y | Y | N | Y | | |
| | | Other edible goods | | | | | | |
| | | Medicinal plants | Y | Y | N | Y | Y | Y |
| | | Resin | N | | | | | |
| | | Bark (incl. cork) | N | | | | | |
| | | Foliage | | | | | | |
| | | Other commercial plants | Y* | Y* | N | ? | | |
| | | Grazing | N | | | | | |
| | | Hunting | Y | Y | | Y | | |
| | | Tourism / recreation | Y | Y | | Y | | |
| | | Education | | | | | | |
| | | Nature conservation | Y | N | | | | |
| | | Heating energy | | | | | | |
| Remarks: *fibers | | | | | | | | |

| FINLAND | | Significant importance | Monetary | Disputable | Job-relevant | Legal access for: | |
|---|-------------|------------------------|----------|------------|--------------|-------------------|-----|
| Indicators → Products / services ↓ | private use | | | | | commercial use | |
| Berries / fruits | Y | Y | Y | | Y | Y | Y* |
| Mushrooms | Y | Y | Y | | Y | Y | Y* |
| Nuts | | | | | | | |
| Honey | | | | | | | |
| Other edible goods | | | | | | | |
| Medicinal plants | N | N | | | | | |
| Resin | N | N | | | | | |
| Bark (incl. cork) | N | N | | | | | |
| Foliage | Y** | Y** | Y** | ? | Y** | Y** | Y** |
| Other commercial plants | | | | | | | |
| Grazing | | | | | | | |
| Hunting | Y | Y | Y | | | | |
| Tourism / recreation | Y | Y | Y | | Y | Y | Y* |
| Education | Y | Y | | | | | |
| Nature conservation | Y | Y | | | | | |
| Heating energy | | | | | | | |
| Remarks: *To pick wild mushrooms or herbs for commercial use, the pickers are recommended to get a special certificate. The landowner's permission is always required for commercial nature tourism. **Decorative plants (moss, lichen) | | | | | | | |

| HUNGARY | | Significant importance | Monetary | Disputable | Job-relevant | Legal access for: | |
|---|-------------|------------------------|----------|------------|--------------|-------------------|------|
| Indicators → Products / services ↓ | private use | | | | | commercial use | |
| Berries / fruits | N | Y** | Y | N | Y** | Y | Y*** |
| Mushrooms | | | | | | | |
| Nuts | | | | | | | |
| Honey | Y! | Y! | Y | N | Y | | |
| Other edible goods | | | | | | | |
| Medicinal plants | Y** | Y** | Y | Y! | Y! | Y | Y*** |
| Resin | N | N | | | | | |
| Bark (incl. cork) | N | N | | | | | |
| Foliage | Y | Y | Y | | Y | | |
| Other commercial plants | Y* | Y* | Y | | Y | | |
| Grazing | N | N | | | | | |
| Hunting | Y | Y | | | | | |
| Tourism / recreation | Y | Y | ? | | | | |
| Education | | | | | | | |
| Nature conservation | | | | | | | |
| Heating energy | | | | | | | |
| Remarks: *Christmas trees **Great importance in private sector ***In state-owned forests - NWFPs free to be collected for one's own need, collection on commercial level requires permission; in private forests - right to use NWFPs is with the forest owner, visitors - use NWFPs with permission (regulation difficult to control) | | | | | | | |

| IRELAND | | Indicators → Products / services ↓ | Significant Importance | Monetary | Disputable | Job-relevant | Legal access for: | |
|--|--|---------------------------------------|---------------------------|----------|------------|--------------|----------------------|---------------------|
| | | | | | | | private use | commer- cial use |
| | | Berries / fruits | N | | | | | |
| | | Mushrooms | N | | | | | |
| | | Nuts | N | | | | | |
| | | Honey | N | | | | | |
| | | Other edible goods | | | | | | |
| | | Medicinal plants | N | | | | | |
| | | Resin | N | | | | | |
| | | Bark (incl. cork) | N | | | | | |
| | | Foliage | Y! | Y | Y | Y | Y** | |
| | | Other commercial plants | Y* | Y | Y | Y | | |
| | | Grazing | | | | | | |
| | | Hunting | N | | | | | |
| | | Tourism / recreation | Y | N | N | N | | |
| | | Education | | | | | | |
| | | Nature conservation | | | | | | |
| | | Heating energy | | | | | | |
| Remarks: | | | | | | | | |
| *Christmas trees | | | | | | | | |
| **Free access to state forests; one cannot enter onto anyone else's land without the owner's consent. License available from state forest to harvest foliage species | | | | | | | | |

| ITALY | | Indicators → Products / services ↓ | Significant Importance | Monetary | Disputable | Job-relevant | Legal access for: | |
|---|--|---------------------------------------|---------------------------|----------|------------|--------------|----------------------|---------------------|
| | | | | | | | private use | commer- cial use |
| | | Berries / fruits | N | | | | | |
| | | Mushrooms | Y | Y | N | Y | Y | Y* |
| | | Nuts | Y | Y | N | Y | | |
| | | Honey | | | | | | |
| | | Other edible goods | | | | | | |
| | | Medicinal plants | N | | | | | |
| | | Resin | N | | | | | |
| | | Bark (incl. cork) | Y | Y | N | Y | | |
| | | Foliage | | | | | | |
| | | Other commercial plants | | | | | | |
| | | Grazing | | | | | | |
| | | Hunting | Y? | ? | | ? | | |
| | | Tourism / recreation | Y | Y?* | Y?* | Y?* | | |
| | | Education | Y | | | | | |
| | | Nature conservation | Y | | | | | |
| | | Heating energy | | | | | | |
| Remarks: | | | | | | | | |
| *Under regulation of regions or local authorities | | | | | | | | |
| *Forest owner has the possibility to prohibit public use by contracts | | | | | | | | |
| **No data available in the country report | | | | | | | | |

| NORWAY | | Significant importance | Monetary | Disputable | Job-relevant | Legal access for: | |
|---------------------------------------|---|------------------------|----------|------------|--------------|-------------------|----|
| Indicators → Products / services ↓ | Private use | | | | | Commercial use | |
| Berries / fruits | Y | Y | Y | N? | Y | Y | Y* |
| Mushrooms | Y | Y | N | N | N | Y | Y* |
| Nuts | | N | | | | | |
| Honey | | N | | | | | |
| Other edible goods | | | | | | | |
| Medicinal plants | Y** | Y | Y | | Y | Y | Y |
| Resin | | N | | | | | |
| Bark (incl. cork) | | N | | | | | |
| Foliage | | | | | | | |
| Other commercial plants | | | | | | | |
| Grazing | Y | Y | Y | Y*** | Y | | |
| Hunting | Y | Y | | | | | |
| Tourism / recreation | Y | Y | Y | | Y | | |
| Education | | | | | | | |
| Nature conservation | Y | Y | | | | | |
| Heating energy | | | | | | | |
| Remarks: | | | | | | | |
| | *Special regulations for cloudberries | | | | | | |
| | **Niche products (local significance) | | | | | | |
| | ***Conflicts with the re-introduction of carnivores | | | | | | |

| LITHUANIA | | Significant importance | Monetary | Disputable | Job-relevant | Legal access for: | |
|---------------------------------------|-------------|------------------------|----------|------------|--------------|-------------------|---|
| Indicators → Products / services ↓ | Private use | | | | | Commercial use | |
| Berries / fruits | Y | Y | Y | N | Y | Y | Y |
| Mushrooms | Y | Y | Y | N | Y | Y | Y |
| Nuts | | | | | | | |
| Honey | | | | | | | |
| Other edible goods | | | | | | | |
| Medicinal plants | Y | Y | Y | N | Y | Y | Y |
| Resin | | N | | | | | |
| Bark (incl. cork) | | N | | | | | |
| Foliage | | | | | | | |
| Other commercial plants | | | | | | | |
| Grazing | | | | | | | |
| Hunting | Y | Y | Y | | Y | | |
| Tourism / recreation | Y | Y | Y | | Y | | |
| Education | | | | | | | |
| Nature conservation | Y | Y | | | | | |
| Heating energy | | | | | | | |
| Remarks | | | | | | | |

| ROMANIA | | Legal access for: | Job-relevant | Disputable | Monetary | Significant importance | Indicators → Products / services ↓ |
|--|-------------------------|-------------------|--------------|------------|----------|------------------------|------------------------------------|
| | | | | | | | |
| | Berries / fruits | Y | Y | | Y | Y | |
| | Mushrooms | Y | Y | | Y | Y | |
| | Nuts | | | | | | |
| | Honey | Y | | | | Y | |
| | Other edible goods | | | | | | |
| | Medicinal plants | Y | Y | | Y | Y | |
| | Resin | | | | N | | |
| | Bark (incl. cork) | | | | N | | |
| | Foliage | | Y | | | | |
| | Other commercial plants | | | | | | |
| | Grazing | | | | | | |
| | Hunting | | Y | | Y | Y | |
| | Tourism / recreation | | Y | Y | Y | Y | |
| | Education | | | | | | |
| | Nature conservation | | | | Y | | |
| | Heating energy | | | | | | |
| Remarks: | | | | | | | |
| *Public custom: public access to on all national forests, collecting berries mushrooms or other biological forest products is to be authorised by the local agency for environmental protection; collector can not gather biological forest products from private lands without owner's permission | | | | | | | |

| POLAND | | Legal access for: | Job-relevant | Disputable | Monetary | Significant importance | Indicators → Products / services ↓ |
|---------|-------------------------|-------------------|--------------|------------|----------|------------------------|------------------------------------|
| | | | | | | | |
| | Berries / fruits | Y | Y | N | Y | Y | |
| | Mushrooms | Y | Y | N | Y | Y | |
| | Nuts | | | | N | | |
| | Honey | | | | | | |
| | Other edible goods | | | | | | |
| | Medicinal plants | Y | Y | N | Y | Y | |
| | Resin | | | | N | | |
| | Bark (incl. cork) | | | | N | | |
| | Foliage | | | | N | | |
| | Other commercial plants | | | | N | | |
| | Grazing | | | | N | | |
| | Hunting | | Y | | Y | Y | |
| | Tourism / recreation | | | | Y | Y | |
| | Education | | | | Y | | |
| | Nature conservation | | | | Y | | |
| | Heating energy | | | | | | |
| Remarks | | | | | | | |

| UNITED KINGDOM | | Significant Importance | Monetary | Disputable | Job-relevant | Legal access for: | |
|---|-------------|------------------------|----------|------------|--------------|-------------------|--|
| Indicators → Products / services ↓ | Private use | | | | | Commercial use | |
| Berries / fruits | Y | Y? | ? | | N | Y | |
| Mushrooms | | N | | | | | |
| Nuts | | N | | | | | |
| Honey | | N | | | | | |
| Other edible goods | | | | | | | |
| Medicinal plants | | | | | | | |
| Resin | | N | | | | | |
| Bark (incl. cork) | | N | | | | | |
| Foliage | | Y | | | | | |
| Other commercial plants | | | | | | | |
| Grazing | | N | | | | | |
| Hunting | | Y | | | | | |
| Tourism / recreation | | Y | Y | Y* | Y | | |
| Education | | | | | | | |
| Nature conservation | | | | | | | |
| Heating energy | | | | | | | |
| Remarks: *Conflict between state and private provision of recreation | | | | | | | |

| SWITZERLAND | | Significant Importance | Monetary | Disputable | Job-relevant | Legal access for: | |
|---------------------------------------|-------------|------------------------|----------|------------|--------------|-------------------|---|
| Indicators → Products / services ↓ | Private use | | | | | Commercial use | |
| Berries / fruits | Y | N | Y | N | | Y | Y |
| Mushrooms | Y | Y | Y | N | Y | Y | Y |
| Nuts | Y | N | Y | N | Y | Y | Y |
| Honey | Y | Y | Y | | Y | Y | Y |
| Other edible goods | | | | N | | | |
| Medicinal plants | Y | N | Y | N | | Y | Y |
| Resin | N | N | N | | | N | N |
| Bark (incl. cork) | | | | | | | |
| Foliage | N | N | N | | | Y | Y |
| Other commercial plants | Y | Y | Y | | | Y | Y |
| Grazing | N | N | N | | | | |
| Hunting | Y | Y | Y | Y | Y | Y | Y |
| Tourism / recreation | Y | Y | Y | Y | Y | Y | Y |
| Education | Y | Y | Y | Y | Y | Y | Y |
| Nature conservation | Y | Y | Y | Y | Y | | Y |
| Heating energy | Y | Y | Y | | Y | Y | Y |
| Remarks | | | | | | | |

ANNEX 3

| | AUSTRIA | BULGARIA |
|---|---|--|
| Old / traditional product or service | mushrooms, berries; +) resin; collection of leaf, litter, foliage and branches (animal fodder); grazing, hunting; water management; recreation | resin, mushrooms, medical herbs, fruits (hip, blackberries, raspberries, blueberries, lime flowers, sambucus flowers & fruits, nuts) |
| Changes / Trends | decreasing | resin; collection of leaf, litter, foliage and branches (animal fodder);* |
| | constant | see: remarks, hunting |
| | increasing | recreation, education, nature conservation |
| Trend product | forest education; heating energy on basis of forest biomass; nature conservation | no data in the Country Report |
| Main product | Besides of timber: hunting | forest floor resources |
| Rare and high value product | no data in the Country Report | no data in the Country Report |
| Export | no data in the Country Report | mushrooms, fruits, herbs |
| Services | protection against natural hazards (mountains), water protection; recreation and forest education, nature conservation | life supporting functions (water preserving, habitat supporting, erosion control...), grazing, bee-keeping, hunting, recreation |
| Access | open; everyone can collect forest floor resources for personal use if the forest owner not explicitly prohibits this use | open under specific regulations; very few of private forests - closed |
| Main current problems | maintenance of protective forests; conflicts between timber production and hunting (game management); sometimes: conflicts between timber production and tourism; reg. mushrooms, berries etc. there is everybody's right plus private right at the same time which makes management difficult; many of NWFPP activities are often excluded from forest enterprise into new economic entities (is only problem of data) | poaching (timber harvesting, hunting, illegal grazing) |
| Remarks | *estimation - no efficient data in the country report non-market products are included (mushrooms, berries only partly marketed; water management and protection against natural hazards not marketed) general remark: currently - services much more important than NW products (NT: wood chips for energy production growing importance) (also reg. hunting the service aspect is more important than the product aspect) | |

| | CROATIA | DENMARK | GERMANY |
|---|---|---|--|
| Old / traditional product or service | fiber materials (Spanish broom, gorse), grazing, medicinal plants | hunting, fishing, no products | Christmas trees, hunting |
| | fiber materials, grazing | no data in the Country Report | no data in the Country Report |
| | no data in the Country Report | no data in the Country Report | no data in the Country Report |
| Changes / Trends | recreation | Christmas trees, greenery, hunting is increasing in value | no data in the Country Report |
| | truffles, basket willow, medicinal plants | Christmas trees, greenery, increasing use of forests for "event"-experience | no data in the Country Report |
| Trend product | | | |
| Main product | forest fruits, medicinal plants (herbs), fibres (basket willow), honey, mushrooms | Christmas trees etc are the main NWF, closely followed by hunting | services named in the table; provisions on specific forest uses by German state laws: organized gathering of mushrooms |
| Rare and high value product | truffles (Istrian peninsula) | Protection of ground water is in some areas a high value service | no data in the Country Report |
| Export | truffles, hunting, medicinal plants | Christmas trees | no data in the Country Report |
| Services | recreation, hunting, water protection, erosion control, carbon sequestration | facilities for nature kindergardens, scouting and other youth activities, horseback riding, fishing licences, hunting rentals, guided tours | services named in the table Provisions on specific forest uses by German state laws: riding, cycling, driving by car, motorsport, camping, caravanning, organized sport events, meetings |
| Access | free | free in State forests and with some restrictions in private forests | in the Country Report - recommendations for German legislation |
| Main current problems | low level of controlling, growing pressure | the dramatic decline in roundwood prices, how to capitalise on the huge interest in recreation benefits | lack of statistics, the market is still in development |
| Remarks | | services play the main role on the market | the main part of German Country Report is about RES-projects and does not fit to country reports framework; probably in former East Germany NWFs are much more popular than in the West. |

| | HUNGARY | ICELAND |
|---|---|--|
| Old / traditional product or service | important products in the past: tree: charcoal, resin, bark, foliage, crop (nuts, fruits), grazing, hunting, fishing; important products at present: charcoal, Christmas trees, ornamental foliage, cones, honey, medicinal plants, mushrooms, moss, reed, snails | there has traditionally been very little use of Icelandic forests for NWF purposes (exception - animal fodder and recreational use) |
| Changes / Trends | decreasing | grazing |
| | constant | berries |
| | increasing | recreation |
| Trend product | honey, medicinal plants, forest mushrooms, Christmas trees | no data in the Country Report |
| Main product | honey, mushrooms, (most important for private forestry); medicinal plants (separated SMEs group, these companies are not interested in traditional forestry); charcoal, Christmas trees, ornamental foliage (most important in state-owned forestry) | berries, mushrooms (collected recreational, for personal use - the survey from 2004) |
| Rare and high value product | medicinal plants | Christmas trees that are used in town squares and usually more than 10 m. are the single most valuable product from the forests. Because the demand for quality is very high, it makes this a rare resource. |
| Export | honey, mushrooms, medicinal plants, snails | non |
| Services | tourism (forest walk, trip, bicycling, taking photos, nature observation, mushrooms picking), hunting, fishing | recreation, education ("forest classrooms") |
| Access | in state-owned forests - NWFs free to collect for own need, collection on commercial level - permission; in private forests - right to use of NWFs belongs to the forest owner, visitors - use NWFs with permission (regulation difficult to execute) | free access to all forests (state and private); commercial harvesting and camping private property - permission of the land owner; state owned land - harvesting of NWFs is allowed (with possible restrictions of the Ministry of Environment in environmentally sensitive areas) |
| Main current problems | there is no information available in case of some product groups (e.g. forest fruits, mushroom production); weak marketing background, and need for development of processing and value adding process | a culture adapted throughout the centuries to life in a treeless landscape; harvesting of NWFs - for the most part done on an individual basis; no figures available for the amount and type of products harvested |

| | FINLAND | IRELAND |
|---|---|---|
| Old / traditional product or service | berries, mushrooms, tarn, tree sap, Christmas trees, different kinds of decoration substances (lichen, <i>Salix</i> species, moss) | there is no tradition in Ireland of using non-wood forest products (general public does not pick berries and mushrooms, no tradition of deer hunting) |
| | decreasing | no data in the Country Report |
| | constant | no data in the Country Report |
| Changes / Trends | increasing | Christmas trees, forest & wild foliage |
| | Trend product | no data in the Country Report |
| Main product | berries and mushrooms | forest recreation, Christmas trees, forest foliage (eg. noble fir, <i>Pinus</i> spp., <i>Tsuga</i>) |
| Rare and high value product | no data in the Country Report | forest foliage incorporated into a variety of Christmas wreaths and a range of other gift arrangements |
| Export | berries and mushrooms | Christmas trees, foliage, forest foliage commodity products and gift arrangements |
| Services | nature based tourism (traditional Nordic cross-country skiing, snowmobile trekking, utilisation of reindeer and game populations, conservation of forest environment, recreational use of forest nature (summer cottages, berry and mushroom picking, hiking, skiing, bird watching, hunting)) | forest recreation |
| Access | Everyman's rights: hiking, biking, skiing, picking flowers, economically most important berries and mushrooms, ice fishing, angling, boating, swimming - free; not allowed: kill or disturb animals, damage growing trees, collect many herb species and special products (e.g. moss and lichen), make an open fire, drive motorised vehicles without the landowner's permission. Fishing (excluding ice fishing and angling and hunting require special permits. To pick up wild mushrooms or herbs for commercial use, the pickers are recommended to have a special certificate. Despite Ev's rights, the landowner's permission is always required for commercial nature tourism. | free access to state forests; one cannot access anyone else's land without consent. License available from state forest to harvest foliage species |
| Main current problems | - | foliage harvest – difficult terrain for workers, accessibility, quality issues in cases where trees are unmanaged |

| | ITALY | LITHUANIA | NORWAY |
|---|--|---|--|
| Old / traditional product or service | bark, medical herbs, manna, leaves and herbs for fodder | resin, mushrooms, herbs, fruits | grazing, collecting grass& leaves, berries, hunting & fishing, cutting peat, moss, lichen |
| Changes / Tendencies | decreasing | chestnuts, mushrooms [excl. truffles], bark, resin, medical herbs, leaves and herbs for fodder | hazelnuts, bark (birch) |
| | constant | pine seeds | moss, lichen |
| | increasing | truffles, cork | berries [in some regions], mushrooms [not significant], hunting & fishing |
| Trend product | truffles | [<i>income source for rural population;</i> gathering mushrooms, berries; countryside tourism | hunting & fishing |
| Main product | chestnuts, hazelnuts, pine nuts, mushrooms (with truffles) | mushrooms (cantharelle and boletus) | cloudberries [in some regions], hunting, fishing |
| Rare and high value product | truffles | no data in the Country Report | herbs for special purposes |
| Export | truffles | mushrooms | no data in the Country Report |
| Services | environment protection, carbon sequestration; recreation | life supporting functions (water preserving, habitat supporting, erosion control, carbon sequestration, biodiversity conservation...); recreation | erosion control, biodiversity conservation; outdoor activities |
| Access | under regulation of regions or local authorities | free, except nature reservations and special areas | open (except nature reservations and special objects) |
| Main current problems | | intensive use of NWFs, weak cooperation of SMEs, lack of knowledge | grass & fodder (conflict of interests); small-holders - difficulties in market integrated products |

| | | POLAND | | PORTUGAL | | SWITZERLAND | |
|---|-----------------------------|---|--|--|--|-------------|--|
| Old / traditional product or service | | Christmas trees, resin, charcoal, tree bark and needles, fruits, medicinal plants, ornamental plants, mushrooms, beekeeping, hunting | cork, chestnuts, pine seeds, grazing, resin | chestnuts, resin, mushrooms, berries, nuts, fir cones, game animals (hunting), grazing, collection of leaf litter, foliage and branches (animal food/ bedding for cattle) | | | |
| | Changes / Tendencies | decreasing | resin, tree bark (tanning), needles | resin | resin, collecting forest litter, seeds | | |
| | | constant | hunting | grazing | hunting, honey, mushrooms | | |
| | increasing | mushrooms, fruits* | cork, mushrooms, recreation | services in common, e.g. recreation, education/ entertainment, nature conservation etc. | | | |
| Trend product | | medicinal plants, mushrooms, decorative plants | cork, pine seeds | alternative funerals, adventure/ education trails, sports | | | |
| Main product | | mushrooms, berries | cork | game animals (hunting), honey, mushrooms, Christmas trees, bark chips | | | |
| Rare and high value product | | medicinal plants** | no data in the Country Report (cork - high value, but not rare!) | no data in the Country Report | | | |
| Export | | mushrooms, berries, herbs, decorative plants | cork, pine nuts | no data in the Country Report | | | |
| Services | | recreation, hunting, education, biodiversity conservation, life supporting functions | carbon sequestration, soil-, water-, landscape- protection | socio-cultural services: environmental education, adventure trails, theme trails, leisure activities, sports, alternative funerals; ecological services: ecosystem protection, biodiversity conservation, protection against natural hazards, water protection | | | |
| Access | | open; collecting for own use - free, commercial harvest - contract with forest administration*** | open | general right of access to the forest (except nature reserve) and also general right of gathering NWFP (cantonal laws have distinct regulations concerning the amount, season etc.) | | | |
| Main current problems | | gaps in statistics, uncontrolled market of forest floor resources, illegal harvesting**** | forest fires | high labor costs, general right of free access (free use of forest infrastructure) and free collecting of NWFP for the public -> conflict with commercial use | | | |
| Remarks | | * estimation - no efficient data available (only purchase recorded) **currently mainly from plantations ***does not work in practice ****policy and regulations do exist, but difficult to execute | | | | | |

| | ROMANIA | UNITED KINGDOM |
|---|--|--|
| Old / traditional product or service | berries, edible mushrooms, medicinal and aromatic plants, Christmas trees, forest seed, fishing, fish-farms, hunting, game, resin, osier, wicker, bee honey, | managed game, edible and medicinal plants and mushrooms, berries, foliage, seeds, bark, and craft materials |
| Changes / Tendencies | decreasing | continued decline in traditional low value products, e.g. thatching materials and even wild food |
| | constant | |
| | increasing | niche or 'lifestyle' products increasing, but at a very small scale. Active recreation inc. MTB |
| Trend product | new national and natural parks have been set up; potted Christmas trees | no data in the Country Report |
| Main product | mushrooms, medicinal and aromatic plants, forest fruits, forest seed and seedlings, hunting and game, pheasants and fish | wild food and foliage |
| Rare and high value product | no data in the Country Report | no |
| Export | berries, mushrooms, venison, pheasants | foliage (inc. moss), wild foods (inc. mushrooms and venison) |
| Services | CO2 sequestration, silvotourism and outdoor activities, communes, communities and private forest management | tourism (mountain biking, wildlife watching, saw mill demonstrations, go-karting, quad biking, pheasant shooting), park- and campsites, green living and work spaces |
| Access | public custom: public access to all national forests, collecting berries mushrooms or other biological forest products is obliged to be authorised by the local agency for environmental protection; collector can not gather biological forest products from private lands without owners' acceptance | all state forests are open for pedestrians. A permit system is operated for motorized vehicles, horse riding, events, and commercial harvesting. |
| Main current problems | the restitution process of privately owned forest land has strongly had an impact on the distribution of income in case of forest fruits and berries | conflict between state and private provision of recreation; rural labour supply for casual picking of resources; mismatch between scale of resource and market demand (demand potentially many times higher than supply which means goods are often imported even when locally available |
| Remarks | the new Forest Code is under public debate and definitive laws are to be issued; the privately owned forest land is still subject to accurate cadaster measurements and there are conflictual situations and illegal harvesting | demand for non-timber forest products from most people is low or does not exist. Niche markets (herbal medicines, wild food, crafts such as basket making and bodging). Farm and forestry incomes have fallen dramatically in recent years and woodland owners are now actively seeking alternative forest based income; Very interesting - moss industry in England |

FOREST PRODUCTS AND SERVICES IN SWITZERLAND - CRITERIA TO ASSESS THEIR ECONOMIC IMPORTANCE

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SUMMARY

In recent years one can observe a paradigm shift in forestry and forest management due to worldwide economic, ecologic and social changes. Nowadays, forests have to fulfil several functions linked to these three dimensions. A contemporary multiple dimensions oriented forest management is focused on alternative uses such as non-wood-forest products and services. To obtain empirical data on the future market potential, a consumer survey about supply, demand and consumption of NWFP&S was conducted on a national level in six cities in different cantons of Switzerland. The data analysis showed that there is a high consumer acceptance concerning forest products and particularly forest services among the Swiss urban population. Despite diverse difficulties of a constant market supply, like for example the seasonality of the products or the free access to forest products other than timber, the NWFP&S have a great potential and esteem among customers. To increase their economic importance for the forest sector enterprises and to access markets in the future, there need to be marketing efforts and sales promotion. Innovations and investments are necessary in order to obtain middle- and long-term structural improvements of rural forestry. In this respect one has to consider that the market perspectives vary among different European countries due to several factors like, e.g., the different wage levels which influence the profit margins.

1. INTRODUCTION

Forest goods and services cover a wide range of material and immaterial phenomena such as wood and non-wood products and services like landscape, clean air, water storage, biodiversity, recreation and silence (Chamberlain et al. 1998, Köchli 2006; Langner 1998). Three criteria can be chosen to assess their social and economic relevance. At a later stage, indicators can be developed from these criteria to allow for cross-cultural comparison among the forest sector all over Europe (Janse and Ottitsch 2005).

As far as the economic valuation (Sills and Lee Abt 2003) of these products and services is concerned, one has to differentiate between a high value, surplus value and existence value dimension. High value products are for instance mushrooms, berries, nuts and kernels and honey. Surplus value is allotted to services such as forest burials, a life-style product that has come into fashion over the last decade and environmental education in forests. The existence value of forest as such has risen in the sphere of its climatic importance as carbon sink, as an area of biodiversity and naturalness and for its aesthetic properties for landscapes serving recreation and wellbeing.

The market value of these products and services varies substantially among European countries. The respective wage levels, domestic demand, and consumption as well as export opportunities determine their economic role and contribution to rural development. Apart from its cultural significance as a traditional branch of the rural and self-sustaining economies, this valuation may be taken as a criterion for the assessment of its economic importance for forest sector enterprises in the future (Gram 2001).

Furthermore, job procurement in the forestry sector and other related sectors of a country's economy is an important criterion of relevance. Employment in the tourism sector, in nature education (e.g. wildlife watching), biosphere reserve management, the souvenir industry and marketing of new products and services can emerge out of these activities. Finally, forest products and services other than timber production have to be seen in view of their policy relevance (de Groot et al. 2002). Forests have become increasingly important as carbon sinks, as spheres of investment for providing ecological services for banks and private investors, as attraction in eco-tourism programmes or providing substantial added value in the vicinity of urban metropolises in the real estate marketing sector. To obtain empirical data on at least some of these relevance criteria mentioned above, a survey among urban potential customers was conducted in Switzerland in 2005.

2. SURVEY ON CONSUMPTION, USE AND DEMAND POTENTIAL OF NWFP&S

The survey, an anonymous semi-quantitative inquiry, was done in six cities located in six cantons of Switzerland (Neuenburg, Luzern, St. Gallen, Lausanne, Schwyz und Bern) in the months of July and August in 2005. Based on a questionnaire, personal interviews were accomplished with passers-by in the shopping areas of the respective

cities on weekdays. A weighted sample was drawn by age and sex of the respondents. The questionnaires comprised open-ended as well as close-ended questions about supply, demand and consumption of non-wood forest products and services.

Almost 900 persons, i.e. 150 persons per city, were interviewed with a standardized questionnaire. The gender distribution of the total sample (N=897) was 56 % women and 44 % men. This represents a significant statistical deviation from an equal distribution (Chi-Square test, $df = 1$, $p \leq .001$). The participation rate of women was also above-average as compared to the Swiss population with 51 % women and 49 % men (BFS 2006). This could possibly be due to the fact that the interviews were made in shopping areas.

The questionnaire differentiated between five categories of age. The age range between 15 and 29 years covered 38 % of the respondents, 22 % of them were between 30 and 44 years old, 22 % belonged to the 45-59 age class, 14 % were between 60-74 years old and 3 % older than 74 years. Compared to the age distribution of the Swiss population, a lot of young persons (15-29 years) participated in the study, whereas the over 60 years old people were represented only to a minor degree (Chi-Square Test, $df = 4$, $p < .001$).

A further question referred to income, i.e. the monthly gross salary of the interviewees. Only 738 (83 %) of the interviewees disclosed their personal income and ranked it according to the pre-defined categories. An income up to 3000 CHF per month was reported by 42 % of the respondents, 37 % indicated 3001-6000 CHF, 16 % stated 6001-9000 CHF and the highest category of more than 9000 CHF was reported by 6 % of the respondents.

The following results refer to questions about supply, demand and consumption of non-wood forest products and services (NWFP&S). The survey investigated the current consumption and use as well as the demand potential of NWFP&S reported by the respondents. The statistic analysis was done with the help of SPSS (Superior performance software system) as well as Excel and includes, depending on the kind of question asked, t-tests, correlations, analyses of variance and Chi-Square tests.

3. RESULTS

3.1. Forest services

What activities do you conduct most frequently while visiting the forest?

This question analyzes the most frequent forest activities (Figure 1). Recreation was by far the most frequent forest activity as it was mentioned by 87 % of the participants, followed by sports activities. Fitness activities like jogging are reported by 34 % of the interviewees, cycling by 20 % and horse-riding by 3 %. Gathering forest products (e.g. mushrooms or herbs) was stated by 23 % of the respondents. Activities like visiting cultural events in the forest, adventure experiences (e.g. tree climbing) or educational activities (e.g. forest schools, nature trails) are exercised by less than 6 % of the participants.

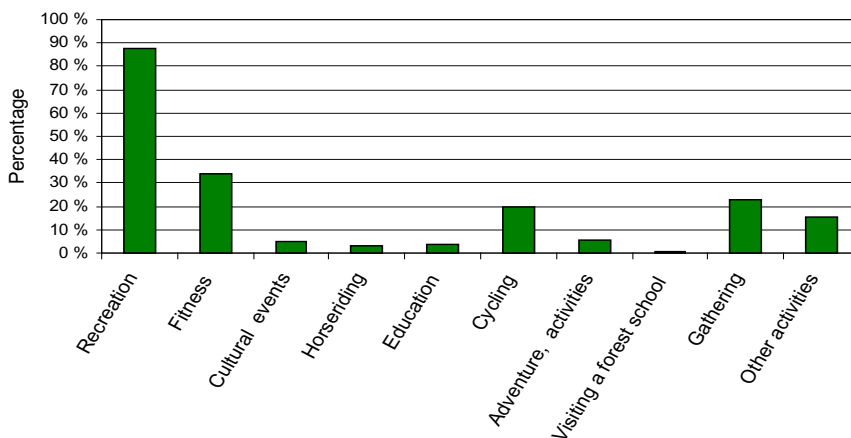


Figure 1. Percentages of respondents stating that they frequently conduct various types of activities in the forest (N = 897).

Are there any activities in the forest which you always liked to do, but never have done so far? If yes, which activities?

This open-ended question was asked to determine the potential of forest services, by inquiring for which activities there is a demand in the forest (Figure 2). Notably, only 232 of the 897 interviewees answered to this question and mentioned an activity. With 40 entries, activities in the sector “sports and games” are most prominent. Each of the activity groups “adventures in the forest” (building tree-, or forest huts, visiting adventure parks), “camping or overnight stay in the forest”, as well as the education sector “get to know flora and fauna” (e.g. guided forest visits, theme trails)

got between 32 and 34 entries. Furthermore, 28 nominations were about “romance and sex”. The group “forest and society” - which contains both, socialising activities like having a barbecue or feast in the forest, as well as activities like cleaning up or helping to protect the forest - got 27 nominations. Finally, activities such as “gathering mushrooms and berries” (28 entries) and “recreation/ self-awareness” (27 entries) were mentioned.

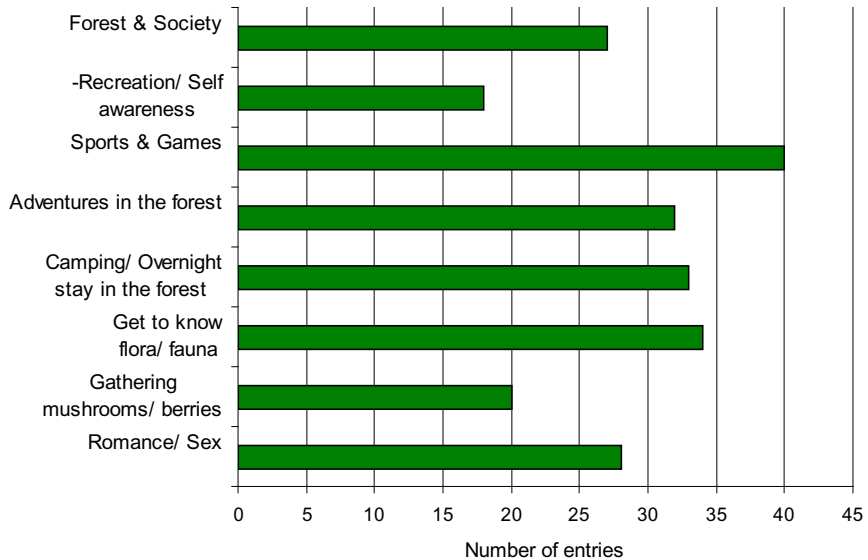


Figure 2. Number of respondents stating that they would like to perform certain activities in the forest, which they have never performed there before.

3.2. Forest products

Which of the following Swiss forest products would you buy?

This question was meant to reflect the actual market potential of various non-wood forest products (Figure 3). The participants could choose between twelve pre-defined categories of products and multiple nominations were possible. Altogether 98 % of the respondents selected at least one of these categories. The answers show that the food sector got the biggest potential. With 80 % positive answers forest honey has the most promising sales potential, followed by berries, mushrooms and roots with over 70 % and chestnut products with 62.5 %. The second most important sector comprises pharmaceuticals and alternative medicines like teas, ointments and herbs (58 %) as well as wellness products, including for example ethereal oils (43 %) and body care products such as lotions and care balm (43 %). There is a comparatively

small demand potential (33 %) for decoration articles (e.g. evergreens, moss etc.), seeds (23 %) or leaves and twigs (15.5 %).

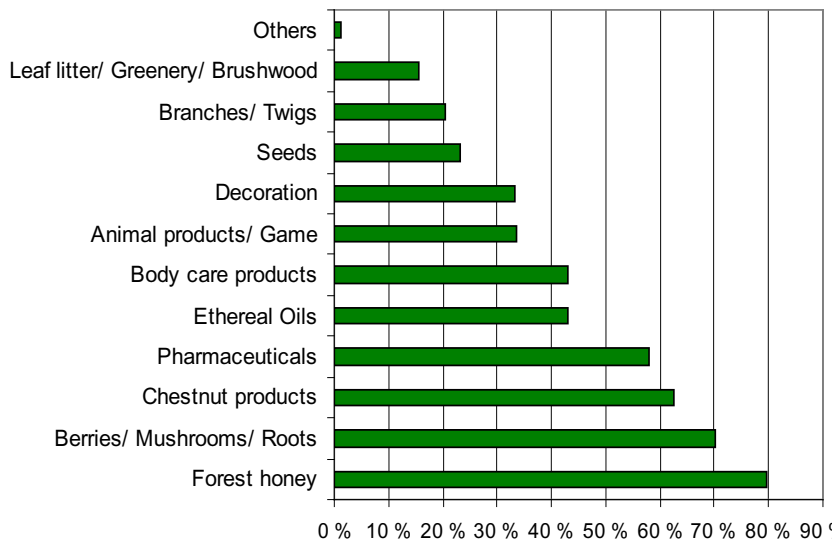


Figure 3. Percentages of respondents stating that they would buy different types of non-wood forest products (N = 897).

Which aspects would you pay special attention to when purchasing forest products?
How important are the following aspects to you?

The participants evaluated eight selected aspects relevant for their decision to purchase a product on a rating scale from 1 (= unimportant) to 7 (= very important). Figure 4 shows the average values of the evaluations. Accordingly, quality (M = 6.3) is the most important characteristic, which is on demand by the Swiss urban population, closely followed by “ecological friendliness” (M = 6.1), followed by certification, price, place of origin and whether these products are an alternative to mass products, with average evaluations ranging between 4.6 and 5.0 (\approx rather important). Thus it seems that a lot of interviewees prefer certified, high quality forest products of regional origin. According to the answers the aspects uniqueness and attractive packaging have a rather minor meaning. But it is to be considered that particularly on the last aspect the interviewees probably try to give the impression that their choice is guided by rational causes. Such a tendency to give rational or socially desired answers can be seen, for example, if the quality of products is claimed to be more important than packaging.

Who should sell Swiss forest products?

The respondents prefer shopping places like market stands (67 %) and retail traders (65 %), whereas the internet (19 %) and discounters (12 %) are regarded as rather unsuitable for buying non-wood forest products. This could be linked to the fact that the respondents associate important aspects of forest products such as quality and environmental friendliness as well as the traceability of the manufacture place and/or the region of origin of the products more strongly with small and intimate shops as compared to large department stores. It points also to the fact that forest products are noticed rather to be high-quality and exclusive products and less as mass-produced goods.

As to be seen in Figure 5, there was a good deal of agreement between the consumers and non-consumers of non-wood forest products with respect to the rank order of suitable providers. Nevertheless, it was generally more important to the buyers that forest products are offered at the different places as compared to the non-buyers. However, the corresponding difference between consumers and non-consumers was only statistically significant in the categories drugstore (Chi-Square Test, $p < .05$), market stand ($p < .05$) and "Heimatwerk" ($p < .01$).

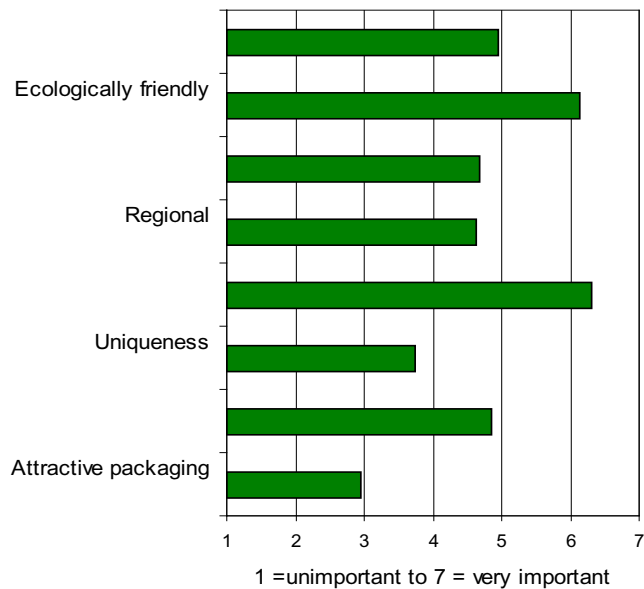


Figure 4. Average ratings of the importance of eight different characteristics of non-wood forest products (N = 877 – 888, varying between characteristics).

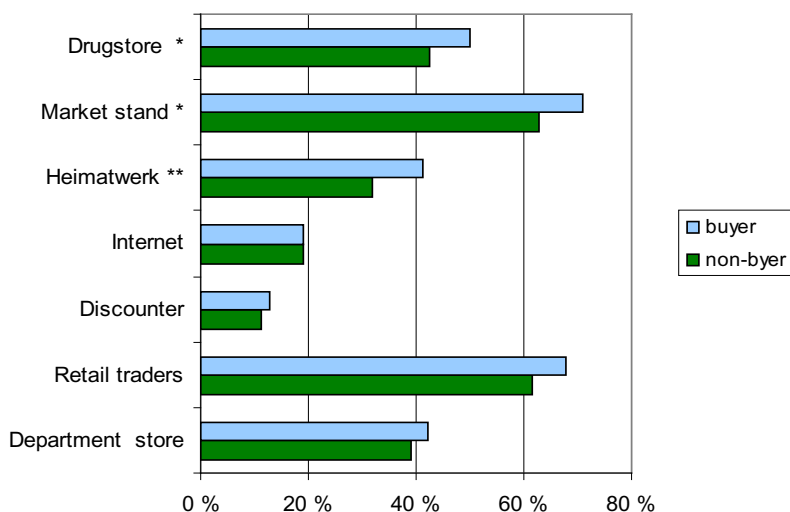


Figure 5. Percentage of buyers and non-buyers of non-wood forest products stating that certain types of selling points should offer such products (N = 897).

4. CONCLUSIONS

Swiss forest users favour primarily forest services and are less interested in buying NWFP. Natural products from forests that are Swiss made have a good reputation and a great esteem among customers. They have a market potential in the German as well as in the French speaking part of Switzerland, but it has become obvious in our research that there is a need for marketing efforts and sales promotion (Alfter 1998, Borowski 1996, Buwal 1997, Buwal 1998).

It is a matter of fact that Swiss rural forest enterprises have not yet developed ways to access markets for NWFP&S. One of the reasons for this is the rather wealthy economic situation of the entire forest sector in the past. Another reason is the lack of trained personnel and introduced and well-working marketing channels. The generally high wage level in Switzerland is an obstacle to a successful marketing of non-wood forest products and services, as their profit margin is rather modest and the market is small as compared to the timber market. This explains to a certain extent the reluctance of forest enterprises to embark on opening up such a segment in a specialised market. Possible marketing strategies in this respect could be to link forest services which are more sought after by the population to the promotion of forest products and likewise to link the marketing of non-wood products to the marketing of timber and other wood products.

5. DISCUSSION

The results of the market survey of urban consumer's demands favours a diversification in the structure of rural forest enterprises and a pro-active market strategy. The important question in this respect is who will take the lead in this process? Will it be big, medium or small forest enterprises which, according to their economic appropriate size, may have decisive advantages before others who have a suboptimal structure. The factors that affect the competitiveness of forest enterprises trying to marketing NWFP&S are low profit prospects in view of the high wage level and a general rather low customer interest in these products in Switzerland (Herrmann et al. 2002).

The barriers to entrepreneurship in general are that NWFP&S have a low market relevance as compared to timber and are predominantly seasonal products giving problems of a constant market supply. As far as the problems for enterprise development in this sector are concerned, the difficulties to enter into a rather unknown and economically not very promising market are an obstacle for an orientation away from timber production towards NWFP&S. The seasonality of the products and services give additional problems to employ qualified and dedicated personnel, because they would have to be well paid and to be given other tasks in the off-season.

In a highly developed market economy such as in Switzerland non-wood forest services have more chances to win a market position than products, particularly if they are well designed and marketed as lifestyle products. For non-wood forest products, main criteria in this process would be the marketing of the "Swissness" of the products and the promotion of a quality label (Hansmann et al. 2006, Teisl 2003) that indicates their ecological friendliness and being a regional product.

REFERENCES

- Alfter, P., 1998. Recherche sur les biens et services non-bois de la forêt suisse: Quantification et essai de valorisation dans le cadre d'un projet de l'OFEFP. Schweizerische Zeitschrift für Forstwesen, 149(2):87-104.
- BFS (Bundesamt für Statistik). 2006. Statistik des jährlichen Bevölkerungsstandes (ESPOP) und der natürlichen Bevölkerungsbewegung (BEVNAT) 2005. BfS, Neuchâtel.
- Borowski, S., 1996. Marketing-Strategien von Forstbetrieben. Schriften aus dem Institut für Forstökonomie der Universität Freiburg. Vol. 7., Freiburg: Institut für Forstökonomie, Albert-Ludwigs-Universität Freiburg.
- Buwal (Bundesamt für Wald und Landschaft, ed.). 1997. Bewertung und Honorierung von Waldleistungen (VAFOR): Orientierungshilfe. Umwelt-Materialien. Vol. 64. BUWAL: Berne.

- Buwal (Bundesamt für Wald und Landschaft, ed.). (ed.). 1998. Überprüfung der Marktfähigkeit von forstbetrieblichen Leistungen. Praxishilfe. Ein Beitrag zur Bewertung und Honorierung von Waldleistungen (VAFOR). Vollzug Umwelt. BUWAL, Berne.
- Chamberlain, J., Bush, R. and Hammet, A.L., 1998. Non-Timber Forest Products - The Other Forest Products. *Forest Products Journal* 48:10-19.
- de Groot, R. S., Wilson, M. A. and Boumans, R.M.J., 2002. A typology for the classification, description and valuation of ecosystem functions, goods and services. *Ecological Economics* 41:393-408.
- Gram, S., 2001. Economic valuation of special forest products: an assessment of methodological shortcomings. *Ecological Economics* 36:109-117.
- Hansmann, R., Köllner, T. and Scholz, R. W., 2006. Influence of consumers' socio-ecological and economic orientations on preferences for wood products with sustainability labels. *Forest Policy and Economics*, 8(3):239-250.
- Herrmann, K., Seeland, K. and Zimmermann, W., 2002. Multifunctional forestry as a means to rural development (Multifor RD): Country report Switzerland. Professur Forstpolitik und Forstökonomie, ETHZ: <http://e-collection.ethbib.ethz.ch/show?type=bericht&nr=86>: Zürich.
- Janse, G. and Ottitsch A., 2005. Factors Influencing the Role of Non Wood Forest Products and Services – Results from a comparative study covering Norway and the Netherlands. *Forest Policy and Economics* 7:309-319.
- Köchli, D. A., 2006. Gewichtung der Ansprüche der Gesellschaft an den Wald. *Schweizerische Zeitschrift für Forstwesen* 157(2):37-44.
- Langner, L., 1998. Non-wood goods and services of the forest (Report of ECA/FAO team of specialists). United Nations: New York, Geneva.
- Sills, E.O. and Lee Abt, K. (eds.). 2003. Forests in a market economy. Forestry sciences. Vol. 72., Kluwer Academic Publishers: Dordrecht.
- Teisl, M., 2003. What we may have is a failure to communicate: Labelling environmentally certified forest products. *Forest Science* 49:668-680.

INNOVATION PROCESSES IN FOREST RELATED RECREATION SERVICES

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SUMMARY

The article investigates innovation processes in the field of recreational services of forests. It takes a close look on innovation cases from five European countries with different institutional backgrounds in terms of forest ownership and access rights to forest land.

The analysis first of all shows that forest related recreation services are developed in different institutional conditions and on public as well as private land. Financing is provided from public and private sources. Ideas may come from within and outside the forestry sector, however, impulses from outside seems to be of primary importance. In sum it can be said that both public and private spheres have important roles in providing natural, financial and human resources and usually a network of public and private actors are involved in innovation processes. Of particular importance are cross-sectoral interactions between forestry and tourism.

A greater institutional support is needed for the development of forest related recreation services as the field is at the beginning of its development. Support should focus on providing ideas and financial resources for product development and on facilitating cross-sectoral interaction between forestry and tourism actors. A particular need is seen to develop models for durable interaction between land-owners and tourism operators on a regional scale.

1. INTRODUCTION

Recreation services that are offered on forest land or by forest land owners and the potential for the development of new 'forest recreation services' are gaining increasing interest throughout Europe by policy makers, land managers, researchers and others. Services, such as hiking, adventure, sports, nature or environmental

education, hunting, fishing, berry or mushroom collection, cultural tourism and accommodation, are provided by many different institutions, for example public or private forest agencies, nature or national park services, environmental education institutions, outdoor service businesses and organisations, forest owners, and others. A significant proportion of these activities are offered by public institutions, and often for free, however the opportunity for public and private actors to develop recreation services and contribute to job and income creation in rural areas is receiving growing awareness.

Indeed, an increasing part of value generation from forest land is likely to come from the supply of non-timber forest services (NTFSs), and not from traditional timber production. Strong long-term forces both on the supply and demand side make this development path very likely. On the supply side, increasing alternative value of labour and decreasing capital costs through mechanisation have led to a rapid decrease in self-employment among non-industrial forest owners. On the demand side, NTFSs are growing in importance. An increasingly wealthy population of international tourists are looking for high quality recreation experiences. Nature and cultural tourism are some of the most rapidly growing tourism sectors in the world and often rely on the conservation of natural and cultural values in forests. Further, the importance of biodiversity and ecosystem services is recognised and rising on political agendas. These trends represent not so much a threat to traditional forestry as a promising opportunity for alternative value generation from the supply of NTFSs (Rametsteiner et al. 2005).

Forest policies in European countries increasingly consider the role of forests in rural development. The new orientation of the European Union Common Agricultural Policy is also towards rural development.. It is therefore important that forestry and rural development research should combine forestry sciences and regional development knowledge (Vennesland 2004). Rural economic development strategies of the 1970's and 1980's focused on how to utilise forest (timber) resources as inputs to the industry sector. During the 1980s, as growth in the industrial sector flattened off or even became negative (Hyttinen et al. 2002), more localised strategies were introduced, allowing local communities to choose their own economic development policies, developing small and medium-sized enterprises (SMEs) networks, and making use of specific and different local resources. In Eastern European countries, rural development and SME development policies were emphasised after mid 1990s, in the frame of the

accession process to the European Union. The development of forest related services well fit into these new development approaches. During the 1990s the rural economic development research shifted from focusing on economic development strategies to focusing on strengthening the development of entrepreneurs. Today we see this entrepreneurial focus has been further developed into a focus on innovation. As the NTFs sector represents a relatively new sector alongside traditional forestry, there is a need to promote innovation in the sector.

In this article, we put the analytical focus on the innovation processes behind the development of new recreational services on forest land in five different European countries. We explain the actors where involved in the process and the resources they contribute. Particular attention lies on the role of public and private actors and resources. The cases of this article are chosen from countries with different institutional settings with regard to access rights to forest land and dominance of public or private ownership. The countries span Western and Eastern Europe and the cases span public and private initiatives. In innovation processes in general, public and private resources are needed. As NTFs are often seen of particular public interest, specific public programs exist in various kinds for provision of these goods and services. Looking at cases from countries with different institutional settings, we want to find out in how far public and private resources are used and in which ways public and private activities are coordinated.

The case chosen for this article are the following:

- Forest pedagogical services of a forest holding (Austria)
- Bird watching services by a nature recreation company (Finland)
- Sports and adventure services by an outdoor recreation company (Norway)
- Nature tourism services in a national park by a tourist company (Romania)
- Mountain bike routes offered by the GB Forestry Commission (UK)

In the analysis the following questions are explored:

- How do innovations in forest-related services occur?
- How do innovators gain access to (and use) human, financial and natural resources? What are barriers to entrepreneurship and success strategies of innovators?
- How is innovation influenced by different ownership?
- Who are the “other actors” within an innovation system?
- How does interaction happen within an innovation system?

2. THEORETICAL BACKGROUND

2.1. Innovation research

Modern innovation research goes back to Schumpeter (1934) who focuses in his economic analysis on the enterprise and the role of the entrepreneur in the economic process. Innovation generally denotes the introduction of novelties in an enterprise, or with that, on the market. With Schumpeter innovation may be broadly defined as a discontinuously occurring implementation of new combinations of the means of production. Innovation research deals with the question, how such innovation occurs and how innovation processes can be fostered.

Early conceptions of the innovation process (Rogers 1962/1995) have gradually been replaced by more complex models. There is a growing consensus in the innovation system literature that innovation is an institutional process (Lundvall et al. 2002, Edquist 2001, Moolaert and Sekia 2003) and that it is not only the entrepreneur that is responsible for the innovativeness of the firm. They have to be embedded in a system of institutions that support them (Rametsteiner and Weiss, in press). Authors refer to such systems as “innovation systems” (Freeman 1987, Lundvall 1992, Edquist 1997, Nelson 2003).

2.2. Innovation systems

The main components of a system of innovation are actors and institutions and their interaction (Rametsteiner et al. 2005). Actors are considered to be organisations, which are seen as formal structures with an explicit purpose and which are consciously created (Edquist and Johnson 1997). Institutions are, in the understanding of North (1991) understood as a set of habits, routines, rules, laws or regulations that regulate the relations and interactions between individuals, groups and organisations (Edquist and Johnson 1997). Interaction between actors and institutional settings are important for innovation activities.

By studying different types of innovation systems (IS), scholars have developed different approaches to innovation system research (Rametsteiner et al. 2005). One debate deals with the nature of national innovation systems (NIS), and especially the way institutional dynamics are interpreted (Edquist and Johnson 1997, Lundvall 1992). The innovation system is defined by national boundaries, within which the interplay of actors on the national level are analysed. Besides of innovation systems of national

economies, authors have focused on sectoral innovation systems (SIS, delimited along sectoral boundaries, e.g. Malerba 2004), regional innovation systems (RIS, employing a territorial concept, e.g. Carlson and Jacobson 1997), and innovation systems pursuing a certain goal, for instance, sustainable development (sustainable systems of innovation, Segura-Bonilla 2003).

With regard to forestry, the sectoral innovation systems approach is of importance as it shows that the forestry institutional system typically has strong boundaries to other sectors. When looking at forest related services which are closely tied to the area where they are produced (and consumed), however, territorial concepts of innovation – as in the regional innovation systems approach – seems of particular relevance as well. Recent research indicates that forestry sectoral innovation systems strongly focus on traditional forest products and tend to omit the development of new products or services (Rametsteiner et al. 2005). Forest related service innovations typically occur in cross-sectoral actors networks where forestry actors are a part but do not play a dominating role (Weiss 2004, Kubeczko et al., in press).

The sectoral innovation system approach provides an analytical framework to identify the performance of systems in terms of how well they support innovations in a specific sector. Breschi and Malerba (1997) define sectoral innovation systems as “systems of firms active in developing and making a sector’s products and in generating and utilizing a sector’s technologies”. A SIS is therefore a system that is mainly comprised of actors of one specific sector and interactions between these. Furthermore, the majority of functions of the IS are fulfilled by actors of the sector. The SIS approach looks at the firm level, inter- firm level aspects as well as the institutional level aspects both of market and non-market relations and focuses on the differences between different types of sectoral innovation systems. The key features of this approach are the differences in and the importance of the knowledge base and the learning process, the role of non-firm organisations and institutions and the co-evolutionary process changing the sector (Malerba 2004). Breschi and Malerba (1997) studied five major types of SIS, including innovation systems of traditional sectors. SIS in traditional, “mature” sectors such as the forest sector often typically support more process innovations than product innovations. Especially, opportunities are pursued to introduce innovations related to reducing production cost. So, according to the theory, non-timber forest products and services are not expected to be supported much by the forestry SIS.

2.3. Innovation processes

With regard to the degree of newness of a novelty, innovations can be classified into such that are new to the market, new to the sector, or new to the firm. From a macro-economic view, innovations that are new to the market or a sector are in the development stage, such that are merely new to firms are in the diffusion stage. For understanding innovation processes, it is interesting to study the role of actors or innovation systems in the development and diffusion of innovations in the economy.

Systems of innovations can be analysed to find out their role or functions in the context of the innovation behaviour of firms and for intentional planning of innovation policy (Johnson 2001). The overall function of a system of innovation is to produce innovations new to the market, diffuse these innovations and use them (Edquist 2001). Edquist and Johnson (1997) summarize the functions of institutions in the process of innovation in three categories:

- Reduction of uncertainties by providing information
- Management of conflicts and cooperation
- Provision of pecuniary and non-pecuniary incentives

The institutional system shall provide knowledge for the enterprise to reduce uncertainties in the economic activities of the enterprise. Institutions (e.g. patent laws, norms for repayment periods etc.) may reduce uncertainty, either by providing information about the behaviour of other people or by reducing the amount of information needed. The institutional system shall manage the competition and cooperation between individuals and groups necessary for an innovation friendly environment, e.g. by supporting networks and clusters. The institutional system shall also provide a system of non-pecuniary incentives to engage in learning and to participate in innovation processes that can make innovation profitable in the long run. Finally, pecuniary incentives such as tax rules, government subsidies and the allocation of resources to universities shall channel resources to innovation activities and help to re-channel resources from those activities that are unprofitable (Rametsteiner et al. 2005).

Related to this functions concept, three important processes can be studied to understand the role of different actors in the development and diffusion of innovations:

- Information flows
- Coordination of actors and conflict resolution
- Financial flows

Information flows would include the contribution of ideas, skills and knowledge, including technical know-how, market information and marketing know-how, financing information, and business skills (management and organisation, cooperation, legal and bureaucratic know-how). Coordination of actors includes both business co-operations as well as any kind of networking among private and public actors. Sources of financing innovations comprise private funding (own resources and from the capital market) and public (and semi-public) funding such as subsidies.

2.4. Innovation in forest-related services

Services differ from products in many ways (see e.g. Miles 2003). For instance, many services are intangible and cannot be stored or transported. Services are often interactive, i.e. customized to particular client needs. Many services are highly information-intensive, partly being able to be supported electronically, others however not. The category of services is in itself very diverse. Some types of services, for instance, are organised rather on a small scale basis and use basic technologies (e.g. personal services), others are dominated by large firms and involve advanced information technologies (finance and insurance).

Forest related services are mainly of two types:

- Environmental services such as nature conservation, local climate regulation, protection of watersheds, prevention of natural hazards, wind-break and prevention of soil erosion
- Recreational services such as walking, hiking, running, biking, horseback riding, hunting, camping, adventure holidays, safari and bird watching, sports, nature and environmental education, etc.

Although many of these services have a long tradition, e.g. natural hazards prevention or hunting, the demand for these services is closely related to modern society. There is a growing demand for nature conservation and recreation which is typically expressed by urban people. As forest areas are mostly relatively natural they have a high potential to fulfil these needs. Forested landscapes are often subjected to nature conservation and they are popular places for trips.

Recent research in Central European countries has revealed that services like these are typically included in the product mix of forest holdings, however, on average

they do not yield significant profit to forest holdings until today.¹ As Figure 1 shows, recreational services make up for a small percentage of the forest holding's turnover in maximum, depending on the average size of the forest holding. Income from nature conservation is negligible. Single forest holdings, particularly such located close to larger urban areas, nevertheless, may make good profit from services like renting camping sites, horseback riding licences and the like.

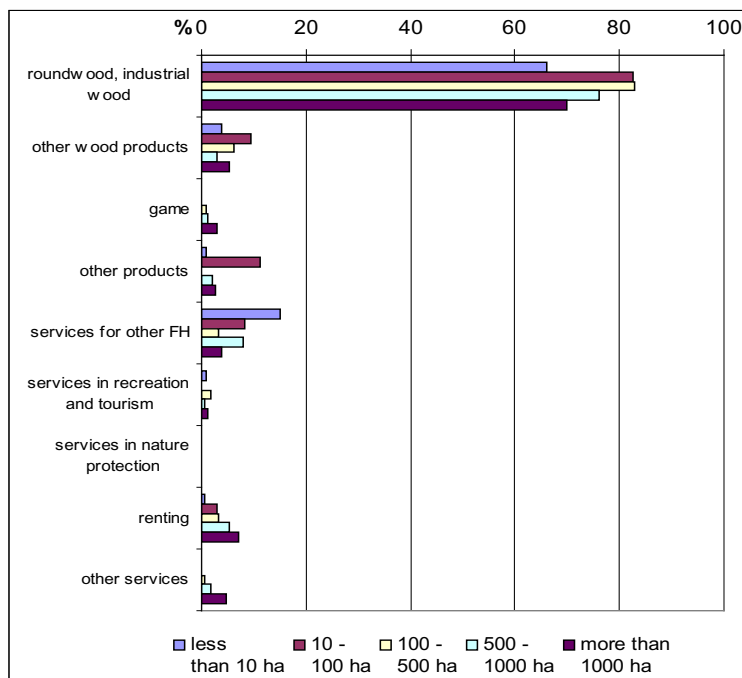


Figure 1. Share of different products and services to the turnover of forest holdings in Central Europe (Rametsteiner et al. 2005).

Looking at where innovations take place at the moment gives an indication of present developments. An overall picture of recent innovations in Central European countries recorded by the forest holdings shows a dominant focus on organizational novelties and new services (Figure 2). The figure shows that the range of newly introduced aspects is quite large and that recreation leads the field in service innovations. Recreation services might therefore grow considerably in importance in future.

¹ In course of the work of the project centre INNOFORCE of the European Forest Institute, among other surveys and case study collections, a representative survey of forest holdings was carried out in 2001 in Central European countries. The data reported here cover Austria, the Czech Republic, Germany, Hungary, Italy and Slovakia. Questions refer to the latest three years (for details see: Rametsteiner et al. 2005, Weiss and Rametsteiner 2005).

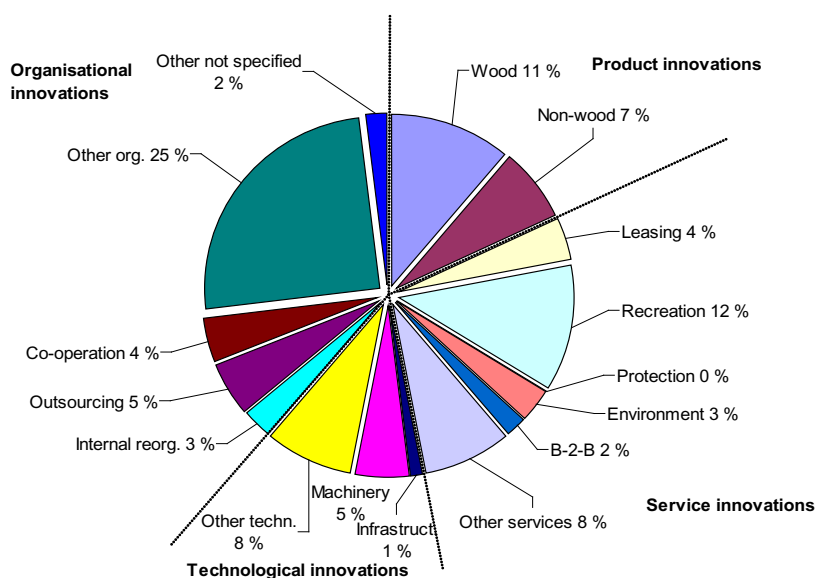


Figure 2. Overview on recent successful innovations in Central Europe (Rametsteiner et al. 2005).

2.5. Public and private resources in innovation processes

Private and public (and semi-public) actors are involved in innovation processes and private and public resources are used. Following Marshall (1890), the resources used in economic development are land (natural resources), labour (human resources) and capital (financial and man-made), whereby social capital can be seen as included in the category of labour (Castle 1998). The resources used in our case studies are hence classified as follows:

- Natural resources: land, ecosystems, landscapes, plants and animal species e.g. trees or birds.
- Human and social resources: knowledge, skills and trust necessary to enable processes such as networking and activities such as the development of strategies and conduct of market research.
- Financial resources and man-made infrastructure: external funding e.g. from economic development projects, grants and subsidies, and internal funding e.g. from personal loans and revenue from business operations.

The natural resources used in forest related recreation services may be public (e.g. state land) or private (own or other private land). Entrepreneurs that want to offer forest related services need access to respective forest land. This access can be

provided by ownership, by contract – or may be provided free. In many countries, forest law provides the public free access to (public and often also private) forest land for recreational purposes, however, this is often limited to personal use excluding commercial activities. Ownership rights on forests are typically restricted in the field of services. Free access to forest land is justified in cases where the provision of these services through market mechanisms would be problematic and would result in a shortfall of supply. On the other hand, public provision of services limits entrepreneurial possibilities.

In cases of free access to forest land, marketing of recreational services is possible in packages with add-on services, like special attractions, restaurants, etc. (Mantau et al. 2001). In the areas of human resources, besides of (private) labour, public research and education institutions and activities as well as extension services are important for the development and implementation of innovations. Besides of private funding (own resources or bank loans), different sources of public funding exist. These may be grants such as from regional or rural development programmes but also the provision of certain services by public institutions. It is not untypical that public forest holdings or nature parks allow the use of their natural resources for free even for commercial uses or that infrastructure like roads or hiking trails are provided by public bodies. Regional tourism marketing activities are typically supported by public agencies (including non-tourism sectoral activities such as farm holidays etc.).

In the countries used in this article, institutional settings differ considerably with regard to access to forest land and dominance of forest ownership (Table 1). Access may be free to all – private and public forest land, including or excluding commercial use. Access may be free only to public forests, or there may be no free access to any forests. Forest land may dominantly be owned publicly or privately, or none of these dominates. Differences may have direct effects (competition of private owners with public owners that possibly offer access or services for free) and indirect effects (characterisation of the national public forest policies).

Our cases cover countries with mixed ownership (Romania, Wales) and countries where private forest land is dominating (Austria, Finland, Norway and UK). In Romania, public forest ownership was dominating until recently, but with further restitution phases after 2001 and 2004, ownership is balanced today. Access is free to all forests in Austria, Finland, Norway and Romania for personal non-commercial use, however, in the Scandinavian countries even commercial use is mostly tolerated

within the scope of everyman's rights to a certain extent (Norway) or if no significant harm is caused to the landowner (Finland). In the UK (except Scotland) only public forests are open for the public and usually allow small scale commercial activities (e.g. involving only non-motorised transport), otherwise they may demand a fee.

Table 1. Institutional backgrounds of the case studies.

| Dominating forest ownership | Free access to all forests, incl. commercial use | Free access to all forests, excl. comm. | Free access to public forests | No free access to forests |
|-----------------------------|--|---|-------------------------------|---------------------------|
| Public | | | | |
| Mixed | | Romania | UK (Wales) | |
| Private | Finland (tolerated) Norway (tolerated) | Austria Finland Norway | UK (except Scotland) | |

3. CASE STUDIES

3.1. Study descriptions

The core of the article is a comparative analysis of innovation cases across countries with different institutional settings. Innovations in forest related recreational services have been chosen as case studies. The case studies are designed as innovation cases on enterprise level, i.e. cases of innovations in a specific enterprise. The innovation may have been introduced by a forest holding, by a different enterprise such as a tourism firm, or may have been the main service of a new start-up. Only when a case is chosen on "ground level", all levels can be included in the analysis from ground to regional, national and supra-national levels. If innovation processes shall be understood, enterprises have to be in the centre of the analysis, however all relevant institutional actors, programmes and policies have to be included as well.

The case studies are from five European countries, each representing a different institutional setting with regard to access to forest land and dominating forest land ownership. The case data have been collected by the co-authors of this article in their respective country, using common guidelines². The data were collected between 2002 and 2005. The data collection methods comprise personal face-to-face, telephone and e-mail interviews with core actors of the innovation project. At least two personal

² Very similar versions of the data collection guide were used for the case study collection within the work of the EFI PC INNOFORCE (Weiss 2002/2005; www.efi-innoforce.org) and the EU Socrates Erasmus IP INNO-FOREST (Weiss 2005; www.inno-forest.org).

or telephone interviews were conducted. Additionally, written sources such as internal planning documents, internal or official project documentations, press releases, newspaper articles, information on websites, brochures and the like were used. In most cases the sites/enterprises have been visited by the case authors.

The case study descriptions that are presented in this paper are structured in the following way:

- The institutional background, including forest ownership structure in the country and access rights;
- A description of the innovation;
- An analysis of the innovation process including the role of actors and the resources used;
- Fostering and impeding factors as well as the strategies to overcome problems.

3.2. Forest pedagogical services of a forest holding (Austria)

In Austria, 80 % of forest land is privately used and timber production is the dominant goals of most public and private forest owners. With regard to recreational uses of the forest, the owners' property rights are partly restricted by the forest law: Everybody has access to any forest land for recreational purposes. Furthermore, berries and mushrooms may be collected for personal use unless the forest owner does not explicitly prohibit their collection. For commercial uses, the approval by the owner is necessary. There is not a high awareness for recreational services of the forest with the exemption of forest pedagogics (German: Waldpädagogik), which is strongly promoted by public agencies and offered by public just as private owners and organisations. The engagement in forest pedagogics, however, is mostly rather connected with PR goals for forestry rather than commercial business goals.

The forest holding Gutenberg, Styria, comprises of 1 600 ha which are managed by the private owner Ulrich Stubenberg. Since 1999 the forest holding offers guided tours to the forest and other "forest pedagogical" activities for school children and adults. The innovative aspect of this case is that the company is developing the field further with the aim to open up new markets, e.g. manager seminars.

The initiative for the new service came from the company's forester who came across an announcement of a forest training school for a forest pedagogics course. In the year 2002, the forester already took some 1 700 children out. The forestry subsidy

programme offers funds for forest pedagogical activities for school children under the title of public relations work. While the school tours – the dominating field – are only positive thanks to public support, programmes for companies are profitable without public funding. As the carrying capacity of the forest holding is almost reached for such activities, the programmes for schools shall not be expanded. Further development, however, is planned for activities that are offered to business clients. For the company, the challenge was and still is to develop this field from a public relations activity to a business field. The activities are profitable but the owner wants to be less dependent on public funds. Strong engagement of public forestry institutions in the field helped to develop and diffuse quickly this new field of services. The case falls into the diffusion stage, as subsidy programme, training courses and a “platform of forest pedagogics” already exist. Own further development is taking place in the company with regard to adult programmes, particularly offers for company clients (manager seminars).

Fostering factors where the existing training courses and the subsidy programme, the personal interest of the forester as well as openness of the owner for this new business and his interest in public relations work.

The owner says that the insecurity regarding the amount of subsidy for school activities that is actually paid after each activity year impedes operative planning. On the one hand, the owner sees it necessary and legitimate to subsidize the school activities and wants to use this opportunity also in future. On the other hand, he is not happy with receiving subsidies and criticises the insecurity of the granted money which makes business planning difficult. His plan is to limit the subsidised part of the activities and to further develop the profitable adult programme.

3.3. Bird watching services by a nature recreation company (Finland)

53 % of the total forestry land in Finland is possessed by non-industrial private owners, 8 % by private companies and 34 % is owned by the State. The statutory nature conservation and wilderness areas are mainly located on State land in the northern part of the country, whereas the highest recreational pressure is in the forests in the southern part of Finland. Nature tourism and recreation services are one of the fastest growing branches in the tourism sector in Finland. Mostly these services are based on forests. Access to recreational use of forests is free for all in Finland without the permit of the landowner, based on Everyman's Rights. This includes the commercial

use, even though the landowners permit for it is highly recommended to have in order to avoid conflicts.

The company Finnature Oy Ltd. provides bird watching and wildlife tours. Their innovativeness lies in the business concept: Finnature has found suitable markets by targeting their products directly to foreign tourists in co-operation with international travel agencies. In addition their network based working method has provided them the needed resources to concentrate on their special area of expertise (guidance and bird watching) and reduced the risks of high investments.

Finnature has used both private and public resources in their development process. The main success factor was the wide knowledge of the entrepreneurs on the substance, their experience in organising tours and good knowledge on the customer's needs already prior establishing the company. An important actor for co-operation has been Bird Life Finland. This NGO has brought significant imago value to the company as well as some customer contacts. Also the co-operation with other companies has been essential e.g. in providing visibility, ancillary services and knowledge on business management and marketing. The most significant public service in the process has been MEK (Finnish tourism board) offering valuable marketing assistance. Also the different development projects has brought the public services reachable. In addition the municipality of Liminka and regional authorities have been very active in developing the nature tourism in the area e.g. by developing facilities. Finnature operates mainly on the State's land area and co-operation with Metsähallitus (national Forest and Park Service) have therefore a significant role.

Fostering factors in this case can be seen the wide knowledge base of the entrepreneurs, good contacts to the key persons/organisations in a narrow specialised sector, good business partners and support from several development projects. In addition publicly provided nature resources and positive attitudes of the local authorities have been important. The impeding factors have been limited resources of the company (time, money), undeveloped domestic markets, strong competition on international markets, difficulty to find suitable business partners for network-based business strategy especially at the early stages of the company and the fact that nature tourism is a relatively new business sector in Finland.

The case points out that the success in specialised nature tourism sector requires in addition to solid business idea, a good business concept. The key issues are, how to organise truly demand driven product development and how to find suitable

partners, for practical every-day work but also to cumulate the knowledge, image and marketing reasons. Especially important is to create good co-operation with so called gate keepers of marketing and customer information. Public actors can provide help to all these issues mentioned above e.g. by rural development initiatives, but the innovativeness of the entrepreneurs is the most significant factor. The role of public support seem to be quite important, not just from the financial point of view but also in providing natural resources, knowledge and co-ordination.

3.4. Sports and adventure services by an outdoor recreation company (Norway)

75 % of Norwegian forest lands are privately owned, the major part of which owned by farmers (full time, part time or former). Everyman's right is strong in Norway and therefore the difference between private and the public owned land in relation to public access and the use of most NTFS for personal use are relative small. Access to all types of forests is free for all. Formally the everyman's right is restricted to non-commercial use, however, commercial tourism is usually tolerated anywhere.

Troll Mountain AS is a private company who offer outdoor adventure activities. Tim Davis and his wife Gjertrud Forgard founded Troll Mountain AS in 1993 as a limited company. Tim Davis has a professional background as officer in the English military. His background in physical activity was important when planning the business of Troll Mountain. The innovation was to have adapted well-known products to local facilities; to have connected adventure packages and the local nature.

The main actor is the owner and innovator in the firm, Tim Davis. Neighbours and local communities were important as they provide land and services for Davis' business. Important inspiration and ideas to develop new products and information on international markets were provided by the "European outdoor life" -network with important collaborators from Germany and Austria. Troll Mountain cooperates with a private land owner from whom they rent a climbing rock, and with Agder Energy who manage a check dam and who control the flow of water in the river which is used for rafting and other water sport activities.

Public resources that are used are: rivers, mountain areas and wildlife (beavers, moose) etc. as well as hiking trails. Private resources are fishing rights, buildings, and the personal skills of owner and of employees. Furthermore, a rock is used for climbing activities.

The main fostering factors where cooperation that where successful with neighbours or the hydroelectric power company. Troll Mountain AS has organised its activities in two different municipalities. With one of the municipalities there is a problematic relationship in the way that the local public services do not want this kind of business in the region. The other municipality is helpful and knows the value of the activities for them. They want to be identified with the image of Troll Mountain. A lack of cooperation among businesses and with public actors is seen as a restraining factor when it comes to the creation of a common strategy of tourism activity within the area. Tim Davis knows about many landowners who offer their own products without any willingness to cooperate within the same geographical area. The most important area of cooperation would be in case of tourist accommodation, adventures and culture.

3.5. Nature tourism services in a national park by a tourist company (Romania)

The Romanian forests were till recently public-owned on 90 % of the forested area. A second and third phase of restitution of forests started, respectively, in 2000 and in 2004 has determined a balanced ownership structure nowadays (half public forests, half other forest owners (private individuals, private entities, forest communities) and proprietors (the communes). The use of forests for recreational purposes is free of charges, irrespective to the ownership, and irrespective to the fact that the recreational activities are individual, or organised (commercial). An agreement with the land' owner is required only in the case of commercial-based harvesting of forest products such berries or mushrooms. All the forests inside the National Park where the innovation is located are in public ownership.

The innovation regards the development of commercial private recreation services on public land. In 1998, the owner of a local business started the cooperation with the Carpathian Large Carnivore Project, leading at that time the eco-tourism programme "Wolves, Bears, and Lynx in Transylvania". One year later the owner launched his own tour operator (Carpathian Tours). The innovative aspect in the development of nature-based tourism is not only to offer accommodation as many other tourism structures in the near area, but also services on wildlife observation and organised forest-based recreational activities. The tour operator receives yearly around 500 tourists.

The key actors are from outside forestry, except the national park administration. The idea for the innovation came from the eco-tourism programme developed by the

Carpathian Large Carnivore Project. They were very active in providing knowledge and co-ordination at the beginning. Later, the national park administration (a public forest management structure) provided their services for wildlife discovering and for practice of nature-based activities. Important role in co-ordination had the local branch of ANTREC (National Association for Rural, Ecological and Cultural Tourism). Members are owners of small accommodation structures mainly in rural areas (guesthouses). The innovator also is a non-forester. He brought in the area the previous experience he had abroad in business management. The financial resources involved were exclusively private (the innovator's own investment). The innovation did not need special infrastructure, except the buildings for tourists' accommodation. The natural capital played an essential role. Without the beautiful landscape and the presence in the area of the large carnivores, the innovation would have not been possible.

Fostering factors for the innovation development were first, the natural capital, including the cultural traditions of the two villages inside the park. A second factor was the networking of NGOs and structures with interest in nature protection and wildlife protection. Particularly, the eco-tourism programme of the Carpathian Large Carnivores Project has contributed definitely to launch the innovation. Third, the personal abilities of the entrepreneur, his motivation and his experience were very valuable. He proved ability to run a business and his strategy of "step by step" development proved to be efficient. The political struggle at the local level between ecologists, hunting associations and public authorities is a first impeding factor. The second impeding factor is the overwhelming bureaucracy; and the third, the fact that in the past years it was almost impossible to get a credit or a loan from the bank. Finally, the lack of transparency of the financing schemes was mentioned by the innovator as an impeding factor too.

The opportunity to implement the business idea was created because of two events that occurred in 1999: first, the launching of the eco-tourism project by the Carpathian Large Carnivore Project; and second, the creation of the administration of the national park. The Park can be characterised as a "learning area" where all the entrepreneurs with activities in rural tourism have to win from co-operation. The benchmarking, e.g. studying the adversary (the competition) to find a better place in the market is an adaptation strategy practiced by the entrepreneur.

3.6. Mountain bike routes offered by the Forestry Commission of Great Britain (UK)

Around two thirds of forests in the United Kingdom are in private ownership with the remainder in public ownership. In Wales, the country of the UK case study, just over half of forest is in private ownership. . National forest strategies place a strong emphasis on the promotion of woodlands for recreation and tourism. In England and Wales, generally forests are not covered by the Countryside and Rights of Way Act 2000 and therefore, unless they are designated for public use, people are not free to enter. The Forestry Commission (FC) who manage public forests do allocate their land for public access and provide people with free access so long as they are using non-motorised transport and conducting non-commercial or small scale commercial activities. Those who wish to conduct large scale commercial activities or take large organised groups into forests must seek the permission of the FC and are sometimes asked to pay a fee. The removal of fungi and plants for any purpose is prohibited.

This case study explores the development of mountain biking trails at a state owned forest at Coed Y Brenin in mid-Wales. The development involved the construction of specialist mountain bike routes in the forest and associated services both on and off site, for example, food and drink, bike hire, bike cleaning facilities and accommodation. The product was new to the UK but also an innovative approach to trail building was taken which resulted in an internationally renowned technique which is environmentally sustainable. In 1999, the site, which is regarded as one of the best in the world injected around £1 million into the local economy which has supported already established businesses and new enterprise.

The initiation of the trails came from mountain bike riders, (one of whom was the local forest ranger for the FC) and a local mountain biking organisation (North Wales Mountain Bike Association). The adoption of the innovation depended on the support of the FC, the forest manager at Coed Y Brenin, who provided the rugged and robust terrain necessary for the trails. Funding for the trails was provided through European Objective one finances, FC funds as well as sponsorship from high profile companies like Red Bull and Karrimor. Information from mountain bikers and mountain bike organisations was very important in the design of the trails. The project was co-ordinated by the FC. Later a broader range of stakeholders, for example local tourism service providers, local communities and tourists boards, were brought in to provide complementary services such as accommodation, food and drink, to reduce

conflict between uses and users and to market the enterprise. The Welsh Mountain Bike Initiative was central to the Welsh Tourist Board Cycle Tourism Strategy and the tourist board played a central role in the marketing of the sites by funding the Mountain Bike Wales website (www.mbwales.com). The mountain biking community is relatively close knit and so the passage of information through users and their representative organisations has been critical in raising awareness and use of the trails. Local tourism businesses also market the trails as a way of attracting clients.

Close collaboration with mountain bikers and mountain bike organisations to inform trail design and marketing, sponsorship by outdoor activity companies to provide high profile image to the routes, as well as a high quality web site to market trails, all helped to make the trails a success.

Resistance to the development from the local community, a lack of understanding by complementary service providers of mountain bikers' needs, a shortage of long term funding for mountain bike rangers and the Welsh mountain bike website (marketing) were impeding factors to the development and success of the trails. Engagements with the local community, training for local businesses, and the use of volunteers to provide mountain bike ranger services have helped overcome some of these constraints.

3.7. Comparative analysis

The case studies explored in this paper cover forest recreation service provisions which can be characterised as being innovative in terms of either the product(s) they offer and/or the process through which products have been developed and supplied. In turn the products are classified according to whether they are new to the market (the forest sector) or new to the firm. Product innovation dominates, whilst new ways of delivering products are explored in fewer of the cases (Finland and Norway). In the majority of the cases, products are innovative as they are new to the market (the forest sector), rather than because they are new to the firm. If replicated at a wider level, this would indicate that forest recreation service provision is at the 'development' rather than 'diffusion' stage of the innovation process. Table 2 summarises the case studies in terms of their character of innovation.

Table 2. Innovations in the case studies of the article.

| | Austria (AT) | Finland (FI) | Norway (NO) | Romania (RO) | United Kingdom (UK) |
|--|--|---|--|---|----------------------------|
| Product innovation or process innovation | Product (forest pedagogic for adults – locals, tourists and companies) | Product (guided bird watching tours) & process (networking & outsourcing) | Product (outdoor adventure activities connected to nature) & process (partnership) | Product (nature-based socially responsible tourism) | Product (mountain biking) |
| New to firm or new to market (forest sector) | New to market | New to market | New to firm | New to market | New to market |

As we note previously, modern innovation theory proposes that innovation is dependent on systems of actors and, in particular, institutional situations and actors. Table 3 profiles the actors which are external to the enterprise who have been actively involved in the delivery of its products and/or services. The table shows that systems or networks of actors have been important, and in most cases, fundamental to successful innovation, with all of the innovators actively co-operating with individuals, companies and/or organisations from outside of their own enterprise in order to deliver products or services.

With the exception of the case from Norway, the involvement of both public and private players has been important and, in most cases critical, to the success of the innovation. The cases also demonstrate a strong propensity for cross-sectoral working between the forestry, tourism and economic development sectors with actors who have responsibilities from the local and regional level through to the national and international scale (horizontal integration). Business to business and business to local community co-operation (vertical integration) also plays a fundamental role in all of the cases, particularly to provide complementary services such as accommodation, food and drink. It is also important as means of over-coming conflicts (of attitudes and behaviours) towards the innovations themselves³.

The role of sectoral actors within the innovation process is summarised in Table 4.

³ For example, in the UK, the mountain bike developments caused resentment from the local community as it brought new people and uses to areas of the forest previously used by a relatively small number of people for 'quiet enjoyment'. As a result, local people experienced increased noise and congestion in and around the local forest

Table 3. External actors involved in the case studies of innovation.

| | Austria (AT) | Finland (FI) | Norway (NO) | Romania (RO) | United Kingdom (UK) |
|---------------------------------------|--------------|--------------|-------------|--------------|---------------------|
| Public actors | Yes | Yes | - | Yes | Yes |
| Private actors | Yes | Yes | Yes | Yes | Yes |
| Forestry actors | Yes | Yes | Yes | Yes | Yes |
| Other land/water manager actors | - | Yes | Yes | Yes | - |
| Tourism/recreation actors | Yes | Yes | Yes | Yes | Yes |
| Economic development actors | - | Yes | - | - | Yes |
| Environmental protection actors | - | Yes | - | - | - |
| Local actors | Yes | Yes | Yes | Yes | Yes |
| Regional actors | - | Yes | - | - | Yes |
| National actors | Yes | Yes | Yes | Yes | Yes |
| European and/or international actors | - | Yes | Yes | - | - |
| Other business and/or local community | Yes | Yes | Yes | Yes | Yes |

As we can see from Table 4, ideas for products and services tend to come from individual innovators personal interests, for example in the UK case from the forester's interest in mountain biking, and in Finland, from the innovator's interest in bird watching. Similarly, the impulse to develop ideas into products and services also tends to come from individual innovators, rather than as a result of organisational impetus. Table 4 also highlights (for example in the Finnish, Romanian and Norwegian cases) that in our cases the ideas and impulses tend to come from actors outside the forestry sector. These findings, particularly if replicated at a broader level, suggest there is an absence of stimuli for and diffusion of new forest recreation products and services from institutional actors, for example forestry, tourism and economic development organisations.

When it comes to delivering products and services, a broader range of actors become critical. Our cases indicate that knowledge and information to reduce riskiness

of operations, finance to develop infrastructure and services, and the co-ordination and development of linkages between actors across the forestry, tourism/recreation, economic development and environmental protection sectors, as well as from local and regional municipalities are fundamental. In some instances, however, whilst forest land is utilised, products and services are delivered without any interaction with the forestry actors (for example in the Finnish case).

Table 4. Role of the actors in the innovation process.

| | Austria (AT) | Finland (FI) | Norway (NO) | Romania (RO) | United Kingdom (UK) |
|---|--------------------------------------|---|---|--|---|
| Product/ process idea | Forester | Non-forester | Non-forester | Non-forester | Forester |
| Impulse to take the idea forward | Forester | Non-forester | Non-forester | Non-forester | Forester |
| Knowledge and information | Forestry organisation (public) | Innovator (private) ¹ Nature conservation organisation (private) Tourism businesses and organisations (private & public) Economic development business and organisation (private & public) | Innovator (private) Tourism organisation (private). | Nature conservation organisation (private) National park administration (public) | Innovator (private) Consumers ² (private) Tourism organisation (public) |
| Financing | Innovator (private) | Innovator (private) Transport business (private) Tourism organisation (public) Municipalities (public) | Innovator (private) | Innovator (private) Agriculture & forestry organisations (public) Municipality (public) | Economic development organisation (public) Forestry organisation (public) Outdoor recreation (private) Tourism organisation (public) |
| Co- ordination | Innovator (private) | Tourism organisation (private) Economic development organisation (public) Tourism business (private) | Innovator (private) | National Park Administration (Public) Nature conservation organisation (private) Tourism business (private) | Forestry organisation (public) Tourism organisation (public) |

1 I.e. The innovator's personal knowledge

2 Mountain bikers and mountain bike organisations.

Successful innovations are also highly dependent on working with a mixture of public and private sector interests, although the Norwegian case demonstrates that this is not exclusively the situation and that new products and services can be delivered using only private actors. As can be seen in Table 4 and Table 5, from our cases it is difficult to identify clear trends regarding the role of public and private sector actors in the processes of innovation and in terms of the resources they contribute to those processes.

Natural resources, and forests in particular, are a central feature upon which enterprise is based in all of our case studies, for example, in the UK case, the rugged terrain and visual screening quality of trees were important in developing exciting yet, unintrusive, mountain bike trails. In the Finnish and the Romanian case, viewing of wildlife is fundamental. The cases from Norway and Austria experience of and interaction with the natural environment is core. As can be seen in

Table 5, both public and private sector actors tend to provide land and wildlife. Both the Finnish and Romanian innovations used regional nature based state funded conservation as a platform on which to base their company's development, however in the Austrian and Norwegian studies privately owned natural resources have been the basis of innovation.

Injections of financial resources directly to innovators have also been a necessity to enable the start up of all of the cases profiled in this paper, with both the public and private sectors being closely involved in providing finance for innovations. The Norwegian, Finnish and Austrian innovations were strongly financed by private sources, for example personal loans or incoming revenue from the tourism operation itself. This kind of approach to financing may be particularly viable where a low level of investment in infrastructure is required. It may have benefits it enables businesses to be economically sustainable from an early stage and to build up their activities slowly and in a planned manner. Sometimes, as in the case of the UK mountain biking study, the role of private actors in providing finance is not particularly critical in terms of the sums of money provided, but rather the kind of image that is gained from the association of sponsors and innovators, for example good publicity for the sponsors and the creation of a high profile and desirable identity for the innovation.

In our cases, public sector funding to innovators has come through development projects (for example in the Romanian study), European Union structural funds or rural development funds (Austrian and UK cases).

Table 5. The role of public and private actors in supplying resources (Pu=Public; Pr=Private).

| Natural resources | Pu | Pr | Financial & man-made resources | Pu | Pr | Human and social resources | Pu | Pr |
|------------------------|----|----|---|----|----|---|----|----|
| Land areas | 3 | 3 | Funding of man-made infrastructure e.g. roads, trails & visitor centres | 3 | 3 | Marketing knowledge and ability | 3 | 3 |
| Wildlife | 2 | 1 | Funding of marketing | 2 | 1 | Business development knowledge | 1 | 2 |
| | | | Investments in training | 1 | 1 | Subject/ substance knowledge and skills | 2 | 2 |
| | | | Ancillary services e.g. roads | 5 | 1 | Staff time | 1 | 4 |
| | | | Networking | | | 3 | 2 | |
| | | | Development strategies | | | 1 | 0 | |
| Complementary services | | | 0 | 5 | | | | |

N.B. The numbers in this table are indicative of the quantity of case studies which exhibit each instance of resource provision. A '0' indicates that none of the case studies exhibits a particular instance of resource provision.

Also important in all of our cases has been indirect funding of innovations through the provision of man-made infrastructure. Some of this infrastructure is general ancillary services such as roads and public transport, whilst others are recreation specific, for example, hiking trails, visitor centres and car parks. In our cases, both the public and private sector provide the recreational infrastructure, whilst the general ancillary services are funded by public sector actors.

Public provision of finance is probably especially important in situations where a high level of facility development is required (for example in the UK study it was used to fund the building of mountain bike trails). Experience in the provision of mountain biking in the UK has found that public funding is often limited in time and thus can create difficulties for the economic sustainability of enterprises when it expires, for example the money required to maintain the Welsh mountain biking web site and to pay the salary of mountain bike rangers has run out. A key challenge therefore lies in finding reliable sources of funding over longer time scales for innovations.

Public funding also plays an important role in knowledge provision and networking. Examples for this are development projects (Finnish and Romanian cases) or the support of training courses and a platform for forest pedagogics (in the Austrian case).

Our cases also demonstrate that human and social resources, that is for example, knowledge in the subject of the product/service being developed (such as guided bird watching tours or forest pedagogics), skills in the delivery of services or business activities (such as marketing), and trust between actors, are fundamental to successful innovation. Trust is particularly important in ensuring productive networking between actors – a process which, as we have noted earlier, appears to be fundamental to successful innovation. The provision of human and social capital appears to often be split between public and private sectors. In our cases marketing knowledge in particular seems to come from the public sector, for example, in the UK it came from the regional tourist board. The private sector however also plays an important role in enabling successful innovation by providing knowledge and skills in complementary service provision in areas such as accommodation, food and drink, and transport. In the case of the Finnish firm, Finnature Oy Ltd, these vertical linkages between businesses, reduced the investments required to start the enterprise and meant the company did not have to operate in areas where it lacked expertise. The riskiness of the operation was thus reduced. In the UK, vertical linkages with other businesses they provided additional marketing for mountain bike innovations, as accommodation providers marketed forest mountain bike facilities in order to attract people to their businesses.

5. INSTITUTIONAL ANALYSIS

It is useful to explore further how institutional conditions impact upon the supply of resources for innovation. In relation to natural resources, land ownership and access legislation influence the extent and nature of supply of natural resources for forest recreational service provisions. As can be seen in Table 6, our case studies span a range of combinations of public/private activity on public/private land use.

Table 6. Natural resources and ownership in the cases.

| | On public land | On private land |
|------------------|---------------------------|-------------------|
| Public activity | United Kingdom Romania | |
| Private activity | Finland Romania | Austria Norway |

The UK case study represents a situation of public activity on public land. Here the objective is not to generate profit for the public forest manager (Forestry Commission) but instead to provide public benefit through the injection of cash (via visitor spending) into local economies, the generation of health benefits to mountain bikers, as well as build community capacity and social inclusion benefits (for example through local people being involved in volunteering and youth programmes). Both the Finnish and Romanian case studies involve private activities (guided nature and cultural tours) on public land. Here the objective is to generate profit for the entrepreneurs, although in both cases there is a strong commitment to promoting environmentally and socially responsible tourism. The Romanian case in particular aims to enable local enterprise development.

The Austrian and Norwegian case studies illustrate private activity on private land. In the Norwegian case, the adventure sports are carried out on land owned by the entrepreneur and land of a local forest owner. The aim with both these case studies is to generate profit. We see therefore that innovation in forest recreation can occur in a broad range of institutional conditions in relation to natural resource ownership. Private land use does not preclude recreational innovation taking place, neither does public land ownership, however in our cases studies there are clear differences between the aims of objectives and nature of provision across different institutional conditions, with private activity on private land being focused on profit making, private activities on public land being also focused on making a profit but with a particular consideration for social and environmental responsibility, and public activity on public land being strongly focused on delivering a broad range of social and economic benefits to society. Further research is required to understand whether these trends are replicated at a wider level and therefore what the implications are of different institutional contexts on the nature of forest recreation service provisions.

Table 7. Property rights and access legislation in the case countries.

| | Free access for commercial activities | Free access for non-commercial activities | No legal access |
|-----------------|--|--|-------------------------------------|
| Public forests | United Kingdom (small scale activities) | Austria, Finland, Norway, Romania, United Kingdom (large scale activities) | |
| Private forests | | Austria, Finland, Norway, Romania | United Kingdom (Wales) ¹ |

¹ Unless specifically designated or classified as 'open space land'.

Table 7 details institutional conditions in relation to access legislation across different land ownership situations. Those conditions which are exhibited by our case studies are highlighted in bold.

The table shows that in all of our case study countries, except UK, legislation (for example Everyman's Right in Norway and Finland) provides free access to public and private forests for non-commercial activities. Usually, mushrooms and berries picking, when individual and non-commercial, is understood as a recreation activity and is therefore free. Commercial activities in forests are also permitted in some cases, although they usually require the permission of the land owner and may be charged. For example in public forests in the UK operators may be charged to gather berries and fungi or for activities that are of a sufficient scale or permanency to require special managerial action. In Austria the permission of the land owner is required before commercial activity can be conducted on either public or private land. In Finland, such permission is not always required according to a recent interpretation of the Ministry of Environment.

Free public access to forests is usually provided on the moral basis of 'public good' - that is, the experience of forests and the countryside is beneficial to public health and well-being and therefore should be accessible to all, regardless of their ability to pay for use. As our case study in Finland illustrates, free public access to forests can create difficulties for commercial innovations where users are unaccustomed to paying for certain activities and experiences, for example, to walk or to view wildlife. This means nature tourism enterprises have to find ways of providing specialised services for which people are prepared to pay and for which there is sufficient market demand. In the case of our Finnish study, this involved tailoring services to international rather than domestic visitors. It suggests that support may be required to enable innovators to link product ideas with consumer demands.

Only in the UK and Romanian cases are legal contexts such that free access to forests for some or all commercial recreation activities is permitted. In Austria, Norway and Finland, commercial recreation operators must typically seek permission of the land owners prior to using forests. The cases illustrate how the institutional conditions in relation to commercial use of forest land are negotiated by customary practices and individual co-operations between land owners and tourism operators.

In Norway and Finland, for example, whilst Everyman's Right does not extend to commercial activities, customary practice means that usually it is practised without

land owner consent or is tolerated by land owners. The physical nature of many forests, for example their extensiveness and their visual screening properties, mean that use of woodlands by tourism operators can go unnoticed by land owners. In these situations land owners are providing free benefits to tourism enterprises. The degree of tolerance of forest managers to free use of their land by tourism enterprises may depend on extent to which they feel the need to diversify into recreation provision themselves and the degree to which recreational activities impact upon other forest management objectives, for example, timber production. Without legal protection, and if conditions change so that the attitudes and behaviours of land owners are less favourably disposed towards free use of forests by recreation service providers, conditions may be less well disposed towards innovation in recreation products and services.

Even where free access to land is available, conditions for recreation service provisions may be less than ideal, with a lack of control by tourism operators over land management activities diminishing the range of services they are able to develop. On the other hand, the land owners may struggle to fund management actions required to facilitate recreation services. The Norwegian case shows how co-operation between an operator and land owner can be used to negotiate institutional conditions to create innovative solutions to these land use 'problems'. In this case, even though free access to forests for commercial purposes is generally permitted under customary practices, the innovator pays for use of a climbing wall in the hope of gaining good will from the land owner to improve hiking trails and develop car parking facilities.

We see therefore that legislation, customary practices, and individual agreements between land owners and operators impact on the exact conditions under which innovations in forest recreation services can occur. It can be speculated that legislation could, in some countries, be re-worked to clarify and/or widen the scope of access and management provisions so as to promote opportunities for enterprise in forest tourism. However, further research is required to understand the opportunities and constraints of different institutional conditions for innovation in outdoor recreation and the means through which the costs and benefits of forest management for recreation may be allocated (for example, between land owners and recreation operators). In particular there is a need to understand current and potential models of relations between recreation service providers and land owners and how they may be used to over-come constraints and promote recreational service provisions in forests.

6. FOSTERING AND IMPEDING FACTORS

Analysis of the case studies profiled in this paper, suggest that a broad range of resources and characteristics of development are critical to successful innovation. These are detailed in Box 1. Similarly, a broad range of factors have been constraints to innovation (see Box 2).

Box 1. Factors which promote innovation in forest recreation service provision.

Social

Personal interest and/or knowledge of the forester/entrepreneur in the subject of the innovation.

Openness of forest owner/manager to the innovation.

An active approach to business development.

Networking/partnership based approach to development and delivery.

Support and collaboration with state authorities and municipalities etc., particularly to provide funding for large scale infrastructure costs and marketing skills.

Co-operation of local businesses, particularly to provide complementary services and reduce risk.

Co-operation of users and user group organisations to inform product development and provide formal and informal marketing.

Sponsors to provide high profile image.

Good relations with local land owners to secure access to and influence over the management of natural resources.

Good relations with those who have penetration into core customer markets.

Public relations work to secure forest land against other uses.

Economic

Externally funded natural resources and man-made infrastructure.

Direct funding to start the innovation, particularly where infrastructure requirements are costly.

Environmental

Access to forested and other land, and influence over land management processes.

Box 2. Impeding factors to innovation in forest recreation service provision.

Social

Resentment of local people and opposition from special interest groups.

Lack of suitable or willing businesses to act as partners.

Overwhelming bureaucracy.

Economic

Lack of economic sustainability of enterprises providing supporting services.

Lack of long-term funding for activities and infrastructure.

Limited resources of time and money of the company in the initial stages of development.

Undeveloped domestic market and strong competition in international markets.

Lack of ability to get finance.

Environmental

Distance from markets (relative to competitors)

Difficulty of securing development of high quality trails and other infrastructure

7. CONCLUSIONS AND RECOMMENDATIONS

7.1. Lessons learnt

This paper has explored a range of innovations in recreation service provisions in the forest sector. These innovations span new products (such as guided bird watching tours and mountain bike trails) and new ways of working (that take a network or partnership based approach to provision) and illustrate that both product and process related innovations are necessary within the forest recreation sector. The cases mirror institutional conditions in the respective countries. As only one case per country was chosen, they cannot be understood as fully representative, however, they provide strong indications in a range of questions. In particular, the cases profiled in this paper suggest that:

Systems of actors are fundamental to innovation.

Natural capital, financial resources and man-made infrastructure, human and social capital are all required for successful innovation. In other words, knowledge and skills based resources, as well as physical and monetary resources are critical for developments.

- Both public and private sector actors and resources are necessary for innovation.

- Cross-sectoral working between forestry, tourism and economic development sectors with actors operating at a range of spatial scales, (local, regional, national and international level) is important to successful innovation.
- Vertical integration with businesses and local communities plays a fundamental role in reducing risk.
- Ideas for innovation and impulses for development come from individuals rather than organisations. This may suggest a lack of support from organisations, for the development and diffusion of new ideas in forest recreational services.
- Ideas and impulses in forest recreational service provision come from outside as well as within the forestry sector.
- Resources to enable innovation come from individuals, businesses and organisations from a broad range of sectors.
- In some instances, whilst forested land is used, there is no active involvement of forestry actors within the innovation process. This can lead to problems for the innovator in terms of a lack of influence over land use management activities, and for the land manager due to a lack of resources to instigate activities to promote recreational service provisions.
- Products are less risky if they are developed in line with consumer demands. Co-ordination with partners who have penetration into core customer markets is important to success.
- Both the public and private sectors are important in providing natural resources, financial resources and man-made infrastructure as well as human and social resources.
- The public sector may be particularly critical to innovation when high levels of direct financing are required to start-up an enterprise. The public sector is also important in providing indirect funding of ancillary services such as roads and public transport.
- The private sector along with the public sector also provides indirect funding of innovation through recreation specific infrastructure provisions, for example, trails and visitor centres.
- Lack of long-term funding for the provision of recreation products and services may be jeopardising the sustainability of the sector.

- Knowledge and skills in services such as the provision of accommodation, food and drink, come from the private sector, whereas knowledge and skills in the substance of the innovation, marketing, business development, come from both public and private sector actors.
- Institutional conditions are likely to have a fundamental bearing on the extent and nature of innovations. Innovation can occur across a broad range of situations in terms of land ownership and access legislation. These legal conditions are negotiated through customary practices and individual agreements between land owners and innovators, to overcome land use 'problems'.

7.2. Conclusions regarding competitiveness and entrepreneurship

COST Action E30 addressed three main questions:

- What are the main factors affecting the competitiveness from the point of view of entrepreneurship?
- What are the barriers to entrepreneurship in the studied field?
- What are the main problems and research questions for enterprise development in the field?

From the study presented here, the following answers can be suggested with regard to innovation and entrepreneurship in the field of recreation:

Factors affecting competitiveness:

- The entrepreneurial orientation of the owner and/or manager of the forest holding is of crucial importance for being open to explore new business fields alongside traditional forestry activities.
- The institutional support by forest or other sector agencies is of particular importance with regard to informational and financial services as well as coordination of actors.

Barriers to entrepreneurship:

- Forest owners have little awareness of market trends in traditional forest products and recreational services.
- A lack of openness to new products and services can also be observed among forest owners and managers as well as in public and private forest agencies.

Problems for enterprise development:

- A lack of contacts to other sector actors (i.e. tourism sector) is a fundamental deficiency.
- Institutional capacities in the forest sector for recreational service provision are not strong enough.

7.3. Recommendations for policy and practice

- There is a need for greater support in the development and diffusion of new product ideas and processes of innovation in forest recreation services from organisations.
- Processes which enable the combination of product ideas with customer demands and actors which have penetration into core markets are required.
- There is a need to provide forest owners and managers with product ideas and an understanding of how innovation in forest recreational services may be delivered and of benefit to them.
- The development of successful models for innovation which bring together actors, in particular, land owners and recreation operators to resolve land use 'problems' (for example, a lack of control over land management processes by recreation operators and a lack of funds available to land use managers to conduct activities necessary to support recreation service provision) should be instigated.
- Cross-sectoral co-operations and networks should be encouraged. Policies should not restrict these possibilities with too narrow sectoral approach. There is a need to integrate forest policies more to rural development.
- Models which promote long-term funding of forest recreation products and services are also required.
- There is a need to build social and human capital to promote innovation in forest recreation services provisions, for example develop tools which promote the exchange and development of knowledge and skills and which create opportunities for joint working.
- Attention should be paid to the institutional conditions in which innovation occurs and consideration given to adapting conditions to facilitate innovation in forest recreation service provisions.

7.4. Recommendations for further research

The case studies presented in this paper provide a useful indication of the characteristics and process of innovation in forest recreation service provision, and associated opportunities and constraints to the development and diffusion of ideas within this sector. They suggest a number of core topics upon which future research on forest recreation service innovations should focus.

At present there is no robust information on trends in forest recreation service provisions across Europe. A quantitative survey of innovation in forest recreation and tourism across Europe is required. This survey would provide an in-depth exploration of the characteristics and processes of innovations, identifying common opportunities and constraints to development, and strategies for promoting innovation.

Whilst this paper has begun to explore how institutional conditions impact upon innovation in forest recreation service provisions, an in-depth analysis of the opportunities and constraints to innovation according to institutional conditions at the country level are required. Besides quantitative survey work, case studies of enterprises which illustrate particular opportunities and constraints of innovation according to the specific institutional contexts of the country in which they take place, should be developed.

Research should seek to understand models which successfully combine actors to resolve land use 'problems' as well as processes for building and sharing knowledge, skills and resources for innovation.

Finally, research approaches which work closely with practitioners from the forestry and the tourism sectors seem promising. This is because a major drawback in the field of forest recreation service innovation is a lack of cross-sectoral cooperation resulting in a lack of awareness of business opportunities (knowledge) and ability (skills) to deliver services. Action research could facilitate the exchange of ideas, knowledge and skills between the sectors to the benefit of both research and practice.

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REFERENCES

- Breschi S. and Malerba, F., 1997. Sectoral systems of innovation. In Edquist, C. (ed.). *Systems of innovation – technologies, institutions and organisations*. Cassell Academic, London.
- Castle, E. N., 1998. A Conceptual framework for the study of rural places. *American Journal of Agricultural Economics* 80(3):621-631.
- Carlson B. and Jacobson S., 1997. Diversity creation and technological systems. In Edquist, C. (ed.). *Systems of innovation – technologies, institutions and organisations*. Cassell Academic, London.
- Edquist, C. (ed.). 1997. *Systems of innovation: technologies, institutions, and organizations*. London, Washington, Pinter.
- Edquist, C., 2001. The system of innovation approach and innovation policy – An account of the state of the art. Nelson-Winter-Conference, DRUID, Aalborg. Available from: <http://www.druid.dk/conferences/nw/>. Accessed 10.02.2003
- Edquist, C. and Johnson, B., 1997. Institutions and organizations in systems of innovation. In: Edquist, C. (ed.). *Systems of innovation: technologies, institutions, and organizations*. London, Washington, Pinter.
- Freeman, C., 1988. Japan, a new national system of innovation. In: Dosi, G., Freeman, C., Nelson, R., Silberberg, G. and Loete, L. (eds.). *Technological change and economic theory*. Pinter, London.
- Hyttinen, P., Niskanen, A., Ottitsch, A., Tykkyläinen, M. and Väyrynen, J., 2002. Forest related perspectives for regional development in Europe. European Forest Institute, Research report 13.
- Johnson, A., 2001. Functions in innovation system approaches: paper at the Nelson winter conference, DRUID, Aalborg, June 12-15, 2001, paper downloaded from <http://www.druid.dk/conferences/nw/> on 10.02.2003
- Kubeczko, K., Rametsteiner, E. and Weiss, G., in press. The role of sectoral and regional innovation systems in supporting innovations in forestry. *Forest Policy and Economics*.
- Lundvall, B.-Å., 1992. National system of innovation: Towards a theory of innovation and interactive learning.
- Lundvall B.-Å., Johnson, B., Andersen, E.S., and Dalum, B., 2002. National systems of production, innovation and competence building. *Research Policy* 31:213-231.
- Marshall, A., 1890. *Principles of economics*. Book II.
- Malerba, F., 2004. Sectoral systems of innovation: How and why innovation differs across sectors. In: Fagerberg J., Mowery, D. and Nelson, R. (eds.). *Handbook of innovation*. Oxford University Press.
- Mantau, U., Merlo, M., Sekot, W. and Welcker, B., (eds.) 2001. *Recreational and environmental markets for forest enterprises – a new approach towards marketability of public goods*. CABI, Oxon.
- Miles, I., 2003. Innovation in services. TEARI working paper No. 16. TEARI project, University of Oslo.
- Moulaert, F. and Sekia, F., 2003. Territorial innovation models: A critical survey. *Regional Studies* 37(3).

- Nelson, R. 1993. National systems of innovation: A comparative study. Oxford University Press, Oxford.
- Rogers, E.M., 1995. Diffusion of innovations. Fourth edition. The Free Press, New York.
- Schumpeter, J., 1911. (English edition 1934). The theory of economic development. Harvard Economic Studies. Vol. XLVI. Cambridge, MA: Harvard University Press.
- Segura-Bonilla, O., 2003. Competitiveness, systems of innovation and the learning economy: The forest sector in Costa Rica. *Forest Policy and Economics* 5: 373–384.
- Rametsteiner E., Kubeczko, K. and Weiss, G., 2005. Innovation and entrepreneurship in forestry in Central Europe. European Forest Institute. Research Report 19. Joensuu.
- Rametsteiner, E. and Weiss, G., in press. Innovation and innovation policy in forestry: linking innovation process with systems models. *Forest Policy and Economics*.
- Vennesland, B. 2004. Social capital and rural economic development, with relevance for the utilization of forest resources. Doctor Scientiarum theses 2004:2. Agricultural University of Norway.
- Weiss, G. 2004: Die Rolle von Innovationssystemen in der Entwicklung und Verbreitung von Biomassefernwärmeanlagen in Österreich. *Centralblatt für das gesamte Forstwesen (Austrian Journal of Forest Sciences)* 121(4):225-242.
- Weiss, G. and Rametsteiner, E. 2005. The role of innovation systems in non-timber forest products and services development in Central Europe. *Economic Studies* XIV(1):23-36.

NWFP&S MARKETING: LESSONS LEARNED FROM CASE STUDIES IN EUROPE⁴

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SUMMARY

This paper presents the key factors affecting marketing of different types of Non Wood Forest Products and Services (NWFP&S) derived from a comparative analysis of case studies reported in the COST E30 'Economic integration of urban consumers' demand and rural forestry production'. The paper is organized into 5 chapters. After a brief introduction, chapter 1 describes the main driving forces and trends on the European market of NWFP&S in the last 15-20 years. In chapter 2, main definitions for non-wood forest products and services are given; dividing them in three categories: mass, specialized and complementary NWFP&S. In the successive chapter the three NWFP&S typologies are further described using a conceptual frame based on some key marketing factors. We finish in chapter 6 with some conclusive remarks.

INTRODUCTION

This paper presents the main results of Working Group 3 the COST Action E30 'Economic integration of urban consumers' demand and rural forestry production', a European network of scientists and professionals who has been working on the following three questions:

- Factors affecting the competitiveness of forest wood/non wood/services – consumer chain,

⁴ The paper has been collectively discussed and organised by all the authors who had different editorial responsibilities: main contributions came from A.Matilainen (especially for Chapter 3.3), A.Hingston (Chapter 3.1) and S.Klöhn (general revision of the paper); D.Pettenella has been responsible of organising the research and coordinating the editorial work.

- Barriers to entrepreneurship and
- Problems for enterprise development in the forestry sector.

More precisely Working Group 3 discussed issues regarding NWFP&S and a Sub-Group, whose results will be presented in this article, studied in particular the key factors affecting marketing of different types of NWFP&S in order to improve profitability of forest-based enterprises.

1. MARKET CONTEXT: DRIVING FORCES AND TRENDS IN EUROPE

Three main driving forces are determining all around Europe a growing attention to NWFP&S: the decreasing prices of wood products, the rising demand for environmentally friendly products, and the rural development policies.

Real prices of industrial roundwood have been decreasing remarkably in the last years, and all major forecasts made by FAO and the United Nations Economic Commission for Europe (UNECE) are showing a constant decrease of real prices of wood products in the near future. Price reduction is affecting mainly rough wood products (trees sold standing and logs on roadside), with remarkable consequences on profitability levels of timber production by private and public forest owners.

Demand for environmentally friendly products is increasing in all highly industrialised countries (Burrows and Sanness 1998, Lober and Misen 1995). Many traditional products that once used to be strictly connected to the needs and consumption behaviour of low-income people are now regarded as natural, health products (FAO 1995, Meadley 1989). Some 'specialty' food products and drinks are more requested than in the past as a consequence of the development of some fashions like the 'Mediterranean diet', the Italian/Spanish/French traditional quality cooking, the increased demand for organic products, natural cosmetics, cosmeo-food, products used in the aroma-therapy, in bio-architecture, in green-building etc.

Rural development policies may also create favourable conditions to stimulate NWFP&S markets: the reform of the Common Agriculture Policy (CAP) has been promoting the diversification of rural activities and new sources of non-agricultural income in European Union (EU) member countries.

In some Balkan countries outside the EU, NWFP&S like mushrooms and chestnuts often play an important role as instruments of local development (Yavuz et al. 1999). In many countries a positive integration has been observed between NWFP and tourism (Campos Palacin 1993). In Mediterranean areas, NWFP&S have positive trends in supply and demand and an increasing economic importance in rural

development. As reported in Table 1, NWFP&S play a remarkable role both in relation to commercial objectives and in terms of total economic values (TEV) of the forest benefits. As stated by Merlo and Croitoru (2005), wood and grazing are diminishing their role as a source of income for the forest owners, tourism and non-wood forest products are increasing their importance to support rural life, especially in higher income countries ('Northern' Mediterranean countries in Table 1, i.e. Portugal, Spain, France and Italy).

Table 1. Average values of benefits from Mediterranean forest areas (Euro/ha/year) (Merlo and Croitoru 2005, p.62).

| | Wood | NWFP | Grazing | Recreation | Hunting | Total | TEV |
|---------------------|------|------|---------|------------|---------|-------|-----|
| - Southern | 12 | 4 | 32 | n.a. | - | 46 | 67 |
| - Eastern | 22 | 5 | 10 | 1 | 1 | 40 | 48 |
| - Northern | 67 | 16 | 10 | 32 | 3 | 125 | 176 |
| Total Mediterranean | 47 | 12 | 13 | 21 | 2 | 95 | 133 |
| % Total | 49.5 | 12.6 | 13.7 | 22.1 | 2.1 | 100 | - |
| % TEV | 35.3 | 9.0 | 9.8 | 15.8 | 1.5 | 71.4 | 100 |

On a global scale, NWFP produced and consumed in Europe have a leading position among the most traded NWFP in the world (see Table 2 where products from European countries are in italics). Vantomme (in Essmann et al. 2005), analysing international trade patterns related to NWFP, gives a good explanation to the relevant market share of European NWFP in the international context: "international trade increased significantly for natural cork, mosses and lichens for bouquets, truffles, mushrooms, chestnuts, bamboo, palm hearts and maple syrup. Interestingly, these NWFP&S originate mainly from, and are traded among developed countries. Also, these commodities are processed locally into semi-finished products with raising unit prices. Of particular interest is the fast increasing value of trade in 'specialty' food products. Specialty foods are among the fastest growing segment in the food catering business and several edible NWFP are ideally fit for niche marketing, such as pine nuts, bamboo shoots or wild edible mushrooms. The reduction (and/or elimination) of import tariffs, increasingly globally applicable (food) quality standards and changing consumer (food) preferences are creating global markets for products which previously were only locally available."

Table 2. Global import values of key NWFP for 1992 and 2002 (in USD 1000) (products from European countries are in *italics*) (Internet 1).

| Commodity description | 1992 | 2002 |
|--|-------------|---------|
| <i>Mosses and lichens for bouquets, ornamental purposes</i> | 9 352 | 25 476 |
| <i>Truffles, fresh or chilled</i> | 4 201 | 23 656 |
| <i>Mushrooms other than Agaricus, fresh or chilled</i> | <i>n.a.</i> | 364 412 |
| <i>Mushrooms & truffles, dried</i> | <i>n.a.</i> | 219 458 |
| <i>Truffles, prepared or preserved, not in vinegar</i> | 3 049 | 11 012 |
| Brazil nuts, fresh or dried | 44 344 | 59 848 |
| <i>Chestnuts, fresh or dried</i> | 109 958 | 184 663 |
| <i>Acorns and horse-chestnuts for animal feed</i> | 1 216 | 7 380 |
| Shea nuts (karite nuts) | 5 155 | 5 136 |
| Liquorice roots | 33 455 | 24 310 |
| Ginseng roots | 389 345 | 221 435 |
| <i>Plants & parts, pharmacy, perfume, insecticide uses</i> | 689 926 | 777 980 |
| Locust beans, locust seeds | 22 395 | 40 239 |
| Lac | 25 286 | 25 653 |
| Gum Arabic | 101 312 | 105 510 |
| <i>Natural gum, resin, gum-resin, balsam, not gum arabic</i> | 92 755 | 96 535 |
| Balata, gutta-percha, guayule, chicle and similar gums | 26 726 | 13 605 |
| Pyrethrum, roots containing rotenone, extracts | 27 865 | 26 173 |
| Bamboos used primarily for plaiting | 37 562 | 50 054 |
| Rattan used primarily for plaiting | 118 987 | 51 327 |
| Kapok | 11 920 | 2 826 |
| Maple sugar and maple syrup | 43 632 | 116 202 |
| Palm hearts, otherwise prepared or preserved | 16 082 | 67 514 |
| Quebracho tanning extract | 51 938 | 45 173 |
| Wattle tanning extract | 63 877 | 34 168 |
| <i>Oak or chestnut extract</i> | 8 653 | 917 |
| <i>Natural cork, raw or simply prepared</i> | 7 874 | 110 702 |
| Abaca fibre, raw (<i>Musa textilis</i>) | 15 221 | 20 374 |

Nature tourism and recreation services are one of the fastest growing branches in tourism sector at the moment. For example during 2002-2003 the turnover growth rate

in Finland has grown in excess of 6.8 % concerning big safari enterprises (Ryymin 2005). Due to urbanisation and the 'new rise' of green values, a growing customer group has evolved, especially from the urban population, resulting in a greater demand for recreation services.

Several studies from Finland have shown that the income originating from nature tourism remains typically in the rural regions and the sector is labour intensive (Saari-nen 2003, Finish Ministry of the Environment 2002, Honkala 2001). This makes nature tourism especially attractive for rural development policies. In addition the indirect economical impacts are more significant than direct incomes to tourism enterprises. It has been estimated in Finland that 2/3 of the incomes benefit other businesses than the actual nature tourism entrepreneurs (Finnish Ministry of the Environment 2002).

Even if the demand for the NWFP&S sector is increasing, there are still many obstacles to overcome before the potential can be fully utilised. One of the most significant problems lays in successful marketing. NWFP&S sector is traditionally very product orientated (Luostarinen, 2005, Matilainen and Aro 2002, Rutanen and Luostarinen, 2000). The companies are typically located in rural areas and distances to the customers are long. Especially in smaller companies the level of segmentation is low, even though to be able to develop high quality products for the demanding customer groups, it is essential for rural micro enterprises to target their services to selected customer groups. This is especially important due to the wide product range in the sector. Besides the understanding of customer groups and their demands, there is also a need to find adequate marketing mechanisms in the sector.

2. LOGICAL FRAMEWORK AND DEFINITIONS

For the comparative analysis of the case studies presented in the COST Action E30 country reports, a conceptual frame for NWFP&S based on the marketing strategy has been developed (see Table 3).

The frame is based on the traditional distinction between products and services. Non wood forest products are commodities of tangible materials, often perishable goods, removed from the forest to supply existing or potential costumers/markets. Non wood forest services are all non-material benefits for customers; their profit acquisition depends on property rights definition and system regulation, e.g. public goods compensation⁵.

⁵ These definitions correspond mainly with the FAO definitions of Non Wood Forest Products. This term is discussed in detail by Mantau et al. 2006 in these proceedings.

Table 3. NWFP&S definitions.

| | a. Products: commodities | b. Services: non-material goods |
|---|--|---|
| 1. Mass market | a1: - raw material with low level of differentiation, - large number of consumers easily recognized, - high competition, price sensitive, - widely available | b1: - public goods, not well differentiated |
| 2. Specialized market | a2: - niche products, - high added value, - unique territories, - very well differentiated products, - high innovation | b2: - as a2, but with references to services |
| 3. Complementary products and services | a/b3: - niche products and services that do not reach critical mass supply or mass products with low added value | |

The classic marketing definition is mainly based on two types of markets for products and services: mass markets and specialized markets. Some NWFP&S are more complex, so we included a third category of multi-products and/or services markets for complementary NWFP&S.

The nature of complementary products varies a lot. In this paper the emphasis is on their complementary role, not on product characteristics. Thus products (commodities) and services (non-material goods) are studied together when their complementary role is concerned. In addition they can have different kind of origins, other than forestry.

The boundaries between the product categories are not always sharp. This is why, in describing possible paths of development of NWFP&S marketing strategies, a frame was elaborated based on the two indicators differentiation and complementarity (Figure 1).

One product/service category can be transferred to another. In many Western European countries the production of mass NWFP&S is not profitable anymore due to high production costs. Two paths of transformation are possible:

- Common mass products can be transferred to niche products when additional qualities are added. One example are Christmas trees, which are

certified by the FSC in Switzerland or sold as 'chemical free' Christmas trees in Germany.

- As an alternative path of transformation NWFP&S can be combined with additional services or products to create a package of complementary products.

In NWFP&S sector complementary products and services can originate from mass products/services as well as specialised products/services. A very basic mass product with low added value and poor market value can create a successful product when combined e.g. with some services. A good example of this is combining handicraft courses into selling the raw material collected from nature, like moss or twigs. Equally complementary products can be individually much specialised niche products that do not reach critical mass of supply independently and therefore need to be associated with other products.

The development is invertible. Successful complementary products may also be developed to mass or specialized products during the product development process and changes in marketing environment.

Case studies presented in Country Reports of the COST Action E30 (Jäger 2005) and additional material (Table 4) were used to test the hypothesis related to the described conceptual frame.

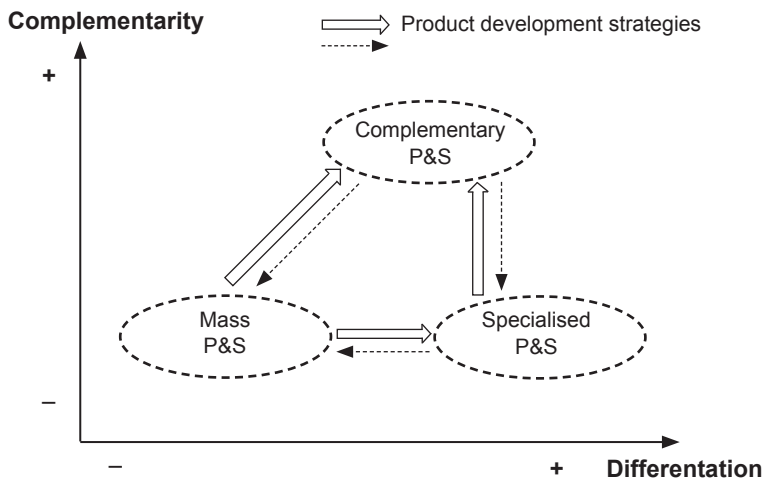


Figure 1. NWFP&S marketing development strategies.

Table 4. Case studies classification.

| | Products | Services |
|---------------|--|--|
| Mass | Foliage (IRL) Christmas trees (DK) Moss (UK) Mushrooms (POL, LIT and H) Berries (FIN) Chestnuts (I, CH) Cork (P) | Pick-nicking (IRL and ISL) Water protection (GER) Nature conservation (A) Hunting (LIT, ROM) Recreation (CRO) |
| Specialized | Birch sap (FIN) 'Chemical free' Christmas trees (GER) Chestnut specialities (CH, I) Truffles (I) <i>Pinus mugo</i> oil (I)* | Bird watching (FIN) Skiing (GER) Funeral tree services (CH, GER*) Environmental Education (H) Art in the Forest (I)* CO ₂ -sequestration (ROM) |
| Complementary | Truffles and tourism (I and CRO) Chestnut and wine (I) Ecotourism (H and IRL*) Mountain biking (UK) Country holidays (NOR and LIT) Biking tours (FIN)* Recreation park services (ROM and IRE)* Recreational services (DK) | |

* Not included in the COST E30 Country Reports (Jäger 2005), reference in the text.

3. LESSONS LEARNED FROM CASE STUDY ANALYSIS

In this chapter, general considerations on each NWP&S category and examples taken from the case studies are presented. Special attention is given to the most relevant key factors in developing each type of NWFP&S presented in the Figure 2. These factors have been selected after preliminary analyses of the case studies. They are sometimes hard to separate from each other and there exist strong links between them. For example any form of quality assurance cannot be made without regulations. Good functioning networks depend always on the competence and willingness for collaboration of the responsible persons. The selling system and packaging are highly influencing the choice of the promotion strategy. Labels and certificates are strong tools for promotion and advertisement.

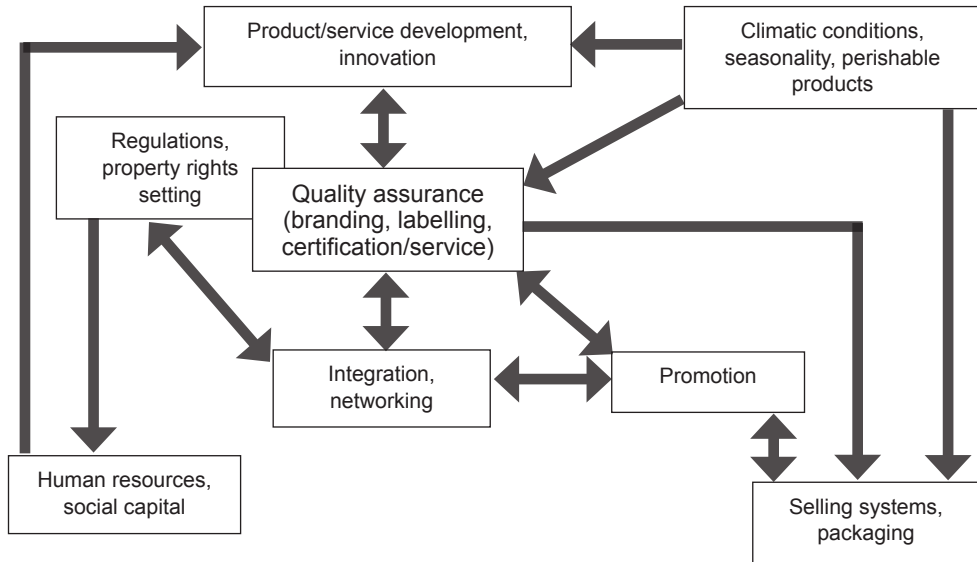


Figure 2. Key factors for marketing of NWFP&S.

3.1 Mass Products and Services

Product/service development, innovation

Mass products are typically commercially produced on a large scale, consequently competition can be very high and markets are frequently over supplied. To compensate for this, successful enterprises have realised the importance of strategic planning to distinguish themselves from other producers.

Fundamental is the identification of factors that create a marketing advantage and provide value to consumers. This need for continuous market intelligence has been identified as a key factor for success, e.g. in the foliage industry in Ireland (see Box 1).

In Denmark an R&D fund was established in 1997 to support continuous innovation and improvement in the Christmas tree business. Half of it is received from a tax paid per hectare on private Christmas trees and greenery production areas and the other half comes from government contribution (Helles and Thorsen 2005).

With little differentiation, many producers can only compete on price. Mechanisation and investment in technology has been used to improve cost effectiveness of some mass product production (mushrooms production in Poland, Zajac et al. 2005). However, as many producers operate in the grey economy, prices paid for products can vary greatly.

Quality assurance

Grading and standardisation are factors that have helped successful enterprises stand out from other competitors. In moving up the value chain, branding and certification allows products to be traced to source, hence producers of good quality products get good reputations (see specialised products). Conversely, poor quality production can turn consumers off and can also lead to wastage. Foliage is sold in standardised packages, Christmas trees are sorted by species, quality, length etc. The final destination of chestnuts (marrons and chestnuts) and hazelnuts depends on the size of the nuts, so they have to be sorted before further processing (Figures 3 and 4).



Figure 3. Standardization and packaging of Christmas trees (Photo: Internet 2).

Regulations and property rights

In the low densely populated Scandinavian countries the free of charge everyman's right to collect NWFP is defined by the law; on the contrary gathering NWFP in densely populated countries in Central/Southern Europe is frequently defined under strict rules. For example in Italy strict regulations exist for gathering mushrooms, truffles and aromatic plants from the forest; in general people have to buy licenses and only a certain amount (e.g. 1-2 kg) is allowed to collect of each kind of mushroom or asparagus in the Veneto region (L.R. 53/1974, L.R. 23/1996).

A shortage of raw material is often problematic to mass product enterprises. Many mass products are harvested in an unregulated and often unsustainable fashion.

In Finland the domestic supply of raw material is the main challenge to harvesters of forest berries. Where product is in short supply, producers are often individualistic and competition exists for access to the best raw material sites, e.g. for mushrooms in Hungary (Meszaros et al. 2005) and moss in UK (Slee et al. 2005). Moss gathering in the UK is one example where licensed harvesters have to compete with the increasing number of people involved in illegal and irresponsible collection. As a result of this, many potential consumers display hostility towards the whole industry (Slee et al. 2005).

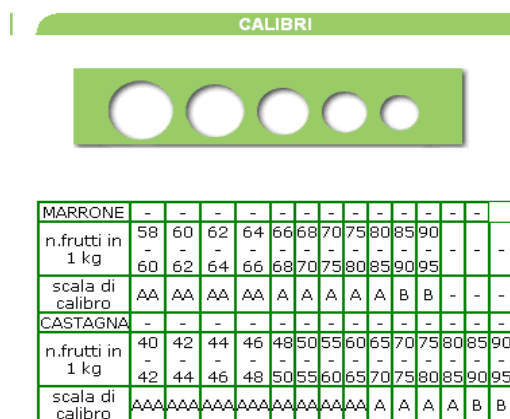


Figure 4. Example of calibration system and sorting of marrons and chestnuts: calibration through number of fruits in 1 kg of nuts (Internet 3).

Many forest services, like soil protection, biodiversity, CO2-sequestration, recreation, etc. are mass services which are free of charge and accessible for everybody. There exists a large field for innovation and opportunities for making them chargeable to give profit to the forest owners. One positive example could be observed in Germany where a non-profit association organized afforestation projects with the aim of increasing groundwater level (Mantau et al. 2005).

Selling systems

The product chain from producer to consumer can follow numerous paths (Figure 5). Larger scale operations tend to operate through a middleman. Marketing companies, buying groups, wholesalers and other merchants are examples of some of the middlemen used in mass product supply chains. In recent times, some producers have been using vertical integration as a way to attain greater control of their products. The Country Report from Poland documents that many firms marketing

forest mushrooms have now developed processing capabilities (Zajac et al. 2005). In an attempt to control quality issues throughout the production chain, cork producers in Portugal have made large investments in vertical integration upstream, towards cork plank preparation (Mendez and Feliciano 2005).

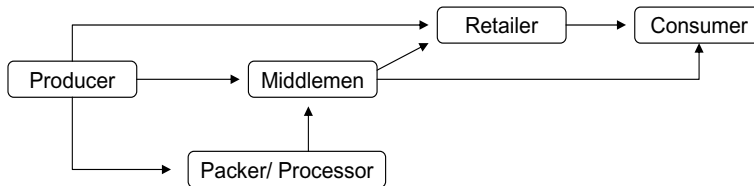


Figure 5. Product chain of mass products.

Integration and networking

Growers or producer associations are founded to improve the value of NWFP&S business activities. Examples can be found for Christmas trees in Denmark, chestnuts in Italy (Helles and Thorsen 2005, Pettenella et al. 2005)

Successful marketing of hunting services have led to high income rates that often exceed revenue generated from the sale of wood. Conflict may occur within forest management practices when precedence is given to wildlife management, e.g. natural generation is difficult to combine with large game population (e.g. Denmark, Helles and Thorsen 2005).

Human resources and social capital

The availability of qualified staff is especially a problem in the rural areas where advanced marketing techniques are needed for developing local NWFP&S business activities. Recruiting adequate numbers of qualified people in marginal area can prove difficult. Personnel may need to be trained, or persons from outside the area will need to be adequately motivated to move in and to stabilize the local business.

Promotion

Networks, e.g. in form of associations, often develop trademarks which may be used to strengthen success on the international market. One such example is the 'Original Nordmann' - Christmas trees from Denmark (Helles and Thorsen 2005).

Climatic conditions, seasonality and perishable products

While certain threats may be controlled or influenced by competent planning, other external factors can potentially devastate production of mass products. Climatic

conditions can have a huge effect on yields. Adverse weather in 1997 led to the loss of 4-4.5 thousand tonnes of black locust honey in Hungary (Meszaros et al. 2005). In Portugal, the cork industry is under constant threat of forest fire (Mendez and Feliciano 2005). Disease outbreaks can also have detrimental effects on production as in the case of chestnuts in Italy and foliage in Ireland (Pettenella et al. 2005, Dhubhain et al. 2005).

Christmas trees have to be harvested and sold over a short period of time. The enterprise examined in the German case study came up with the innovative idea of marketing Christmas trees all year using a credit slip system (Mantau et al. 2005).

Most NWFP are perishable and have to be sold before they start to deteriorate. If markets are not found for harvested material, wastage will inevitably ensue. Rapid delivery channels and appropriate storage facilities such as refrigeration can play an important role in ensuring perishable mass products are received by the customer in good condition (e.g. Christmas trees in Denmark, Figure 6).



Figure 6. Delivery time for Christmas trees and greenery from Denmark (Internet 4).

Many forest food enterprises use processing to prolong the shelf life of their products. Drying, freezing, jam, jelly and syrup production, vacuum packing, powder making and canning are some of the ways mass products like berries and mushrooms are preserved. In Poland enterprises which are selling vegetables and fruits are selling also mushrooms, using the same production lines and marketing channels (Zajac et al. 2005).

Box 1. A special case study of development of a mass product enterprise to a specialised product enterprise: Foliage marketing in Ireland.

With forestry in Ireland continuing to face difficulties, the potential to generate revenue from NWFP'S including forest foliage production holds much appeal. Forest foliage refers to plant material found in the forest environment that may be harvested and used to enhance floral arrangements. It has been recognised that several species commercially grown in Ireland make good foliage candidates, as they possess desirable traits of colour, scent and texture. Over the last number of years, a concerted effort has been made to develop a viable forest foliage industry and Irish producers have successfully positioned themselves at the top end of the market.

The world flower and foliage trade is estimated to be worth \$20 billion with foliage accounting for \$1 billion of this sum (Kelly and Whelton 2003). Most trade is centred around the auction houses in Holland. Here prices are determined and 30-40 % of the European market is controlled (Collier et al. 2004). Along with these auctions, the floriculture industry operates through florists, wholesalers and supermarket packers. The main markets for Irish foliage are in the UK and Holland.

The following factors have helped drive the success of forest foliage production in Ireland:

Quality

As identified in market research, both Dutch and British traders have high operating standards (Kelly and Whelton 2004). Consequently, many buyers regard quality as a prerequisite. Ireland is fortunate in that its mild climate rarely suffers from extremes of heat or cold, factors which can be detrimental to foliage quality. A wastage level of 5 % is generally the maximum permissible and any produce deemed unsuitable after this will result in a claim. Claims can have a profound effect on enterprise profitability so to avoid this, producers operate on a cut to order basis and do not carry stock for long periods of time. The imposition of strict quality controls on the forest floor and in the warehouse also ensures that only foliage of the highest quality is shipped.

Grading

In the past foliage was regarded solely as a filler or complement to flowers. Traditionally sold either by weight or ungraded bundle, recent years have seen changes in the way foliage is graded and presented. Demand for uniform stems graded to a specified length has resulted in many forest greens attaining higher prices than before. Many large packers now only use graded foliage especially where a uniform finished product is required.

Availability of critical mass of products

Many of the large supermarket packers demand good quality foliage in large volumes. Marks and Spencer the English supermarket need as many as 10 000 stems of foliage per week over a period of 8 weeks (Kelly and Whelton 2004). To satisfy this need, producers need access to large areas of production.

Innovation

The influence of fashion permeates the industry and producers need to continue to research new species and develop novel ways of presenting products. This has given producers opportunity to add value to commodity items, for example production of painted or glittered twigs.

Research

Perhaps the most important factor in the development of the Irish foliage industry. Government bodies, third level institutions and industry partners work together to develop greater technical knowledge and marketing expertise. Current research projects include a study to determine the potential of harvesting cut foliage from a range of forest species without affecting the crop's ability to produce timber and a screening program for new species suitable for forest foliage production.

Environmentally friendly products

While attitudes to environmental issues vary from customer to customer, most of the larger supermarket chains insist on supplier compliance with MPS and Eurogap protocol. MPS is a Dutch certification system developed for the floriculture industry. Its aim is to reduce the environmental impact of the industry and improve the image of the sector. The largest producer of forest foliage in Ireland has already achieved an MPS A rating, which stands for most environmentally friendly cultivation. As is true of other NWFP's, the sustainability of harvesting forest foliage is becoming of more importance to customers.

Good customer relations

Like any business, good relations with key customers can bring about repeat business. As there are no formal structures in place for producers to receive feedback, close communication channels will allow producers to better meet customers' needs.

Industry involvement

Continued presence at trade shows, workshops and demonstrations provides a good platform to network with potential and existing customers.

Logistics

As Ireland is an island on the periphery of Europe, logistics can greatly affect the viability of a NWFP enterprise, particularly where fresh produce is involved. With higher transport costs and delivery taking more time, producers have to ensure foliage is harvested and packed in an economical way. By working with a reliable Dutch courier specializing in horticultural products, foliage is transported in refrigerated trucks to its final destination in the UK or Holland.

3.2. Specialized products and services

The term 'specialized' products and services refers to the markets/consumers without any references to the concept of specialized forest management (vs. multifunctional forests).

Typically specialized products and services are well differentiated and have high added value. Some products are niche products because of a relatively limited quantity of supply (e.g. specialties like truffles).

Based on the case studies two types of enterprises can be distinguished:

- Small- and medium-scale enterprises with limited financial and labour resources, normally working only in the forestry sector, which are specialized on small-scale activities like e.g. birch sap and bird watching in Finland (Ollonqvist et al. 2005) or funerals and burial in forest in Switzerland (Seeland et al. 2005);
- Larger enterprises, not necessarily working only in the forestry sector, that are producing/selling a large range of products and services, including some specialised products like e.g. 'chemical free' Christmas trees in Germany (Mantau et al. 2005), kindergartens in Denmark (Helles and Thorsen 2005).

Product/service development, innovation

The role of segmentation and correct customer information is important when specialised products and services are in concern, since they are typically targeted to very narrow customer groups. That can be illustrated from one example of Finnish entrepreneurs on the field of nature tourism. The enterprise offers bird watching and wildlife tours. The result of intensive market research - clients are typically foreign, solvent, interested in nature and 65 years old - gave the possibility to develop the activity for this special group of customers (Ollonqvist et al. 2005).

Often the decision of activity in the sector of NWFP&S is made ad hoc without a clear business plan and market research. In many cases activities are based on personnel interests or hobbies from which the business idea was developed. The advantage of this approach is on the other hand wide knowledge base and insider information of the entrepreneur. Combined to business orientation, this approach has been very successful e.g. in cases of bird watching in Finland and mountain biking in UK (Ollonqvist et al. 2005, Slee et al. 2005).

While mass markets include mainly traditional products and services, many specialized products are 'new' products or recuperated traditional products, which were already almost forgotten or out of commercial use for a long time.

One example of these very traditional products is birch sap in Finland (Ollonqvist et al. 2005). Other 'new' products are adventure forest parks, businessmen course centres for example in Denmark (Helles and Thorsen 2005), CO₂-sequestration (see

Box 2), alternative funerals for men and pets (Seeland et al. 2005 and Figure 6), music plays or art shows organised in forest areas (Figure 7).

Box 2. Opportunities for forest and land owners to benefit from the potential market for carbon credits (Ciccarese and Cascone 2006):

- Rent the land to organizations that use investments funds from private companies or institutional investors to plant forests or to manage existing forests (No upfront capital nor management costs are necessary. A steady income is provided.)
- Establish a commercial forest on their own land or manage their forests for carbon credits: Carbon credits would need to be calculated and verified against a proposed national carbon accounting standard, but could then sold into an emissions trading market; contracts between land owners and governments are necessary (responsibility for debits, upfront establishment costs and annual maintenance, prior to receiving any income from sale of timber). At harvesting, carbon sequestered is deemed to be emitted.
- Establish forest plantations or manage existing forests for other objectives: combat desertification, maintain biodiversity, restore landscape, NWFP production, etc., with the intention that such a forest would never be harvested (no revenue will be received from wood products, the only revenue will be from the sale of the carbon credits).



Figure 6. Alternative funerals in Germany: People can choose a tree or other natural monument for themselves or the whole family to be buried under (Photo: Internet 5).

Especially in the sector of food products, packaging and processing companies introduce different production lines for diversifying their products. For example; numerous different chestnut specialities have been developed in Italy and Switzerland (Pettenella et al. 2005, Seeland et al. 2005). As mass products they were just dried or frozen, now we can find many specialities like flour, jam, beer, etc. (Figure 8).

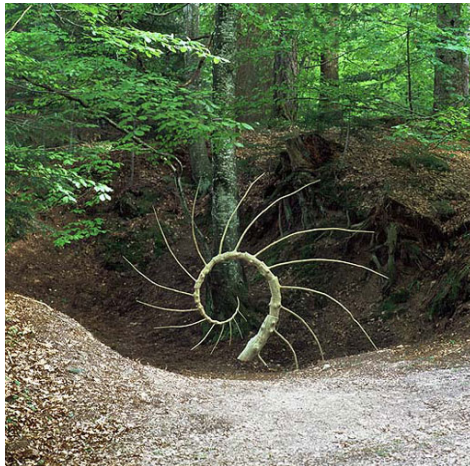


Figure 7. Art in the forest: Arte Sella in Italy (Internet 6).



Figure 8. Example of chestnut specialities: Chestnut flour with pine seeds and raisins to prepare, following a traditional recipe, the typical cake *castagnaccio* in Italy

Quality assurance

Certification is an important instrument for product differentiation in the forestry sector and gives the possibility of price premiums for certified products. Quality assurance and standardisation of mass products are further developed to different certification schemes, labels and brands.

For NWFP we can find different standards for certification: as for wood products, NWFP can be certified under the standards for sustainable forest management and the chain of custody. For food products, similar to agricultural products, certification systems for quality and origin have been developed.

Certification systems have been developed also for some services (e.g. the Carbon certification standards for forest investments developed by two of the main certification bodies in the world SGS and DNV or the sustainable tourism management standard developed by Rainforest Alliance). However specialized services remain a dilemma in this context, because there does not exist proper patent mechanism for them. Imitation by competitors is a problem for many recreational and educational services. Often ideas are copied, like topics of courses for environmental education.

Food products and specialties often have a strong link to the territory and are certified for their origin. For example in the case of truffles highest prices are paid for truffles from places with old truffle traditions, like the white truffle from Alba in Piedmont (Italy). Over the last few years, cheaper and lower quality truffles from Balkan region and China were sold on the Italian market as Italian truffles (Pettenella et al. 2005).

To ensure product quality and prevent copying of food products the European Commission developed several certification systems to promote and protect food products, known as PDO (Protected Designation of Origin), PGI (Protected Geographical Indication, see Box 3) and TSG (Traditional Speciality Guaranteed). Some chestnut proveniences from Italy are certified under European and Italian certification regulations (see Table 5).

Table 5. 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 Mugello (PGI), chestnut from Monte Amiata (PGI), chestnut from Montella (PGI), Marron di San Zeno (PDO) |
| Traditional Speciality Guaranteed (TSG) under Council Regulation 2082/92 | Eight 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 |

* Internet 7.

Box 3. Mushrooms from Borgotaro.

In Italy, close to Parma, there is a region, where mushroom companies and local mushroom-interested people want to identify 'Fungo di Borgotaro' meaning only four species of mushrooms: *Boletus edulis*, *Boletus aereus*, *Boletus aestivalis* and *Boletus pinicola*. All of *Boletus* species are named 'Porcini' in Italian. Even today this product stands out for its typical aroma and clean smell, non-spicy and without any odour of hay, liquorice. Organoleptic characteristics of these products are denoting quality and excellence, which differentiate them from similar products from other areas. Since 1996 the trade name 'Fungo di Borgotaro' has been appearing on mushroom products as IGP trademark (Indication of Protected Geographic Area) according to EC Regulation no. 1107/96. This mark guarantees a natural product with superior quality.

Certification of forest management as a marketing tool for NWFP&S is still a new issue. The FSC (Forest Stewardship Council) and the PEFC (Programme for the Endorsement of Forest Certification schemes) as the most common certification systems for forest management developed also criteria for sustainable management of non wood forest products⁶. Examples for FSC certificated products are Christmas trees from Switzerland (Figure 9), oak tree bark, onion leaves and herbal tree from Denmark or Christmas trees and greenery from Lithuania (Shanley et al. 2005). The PEFC certified oil from *Pinus mugo* in Italy (Figure 10).

For very specialised products it is also possible to use unofficial labels or quality recommendations. For example a Finnish bird watching company has a close co-operation to the international BirdLife organisation. This organisation is a familiar and trustworthy organisation for the customers and a recommendation from it is a very high valuable quality guarantee.

Regulations, property rights

For NWFP&S formerly used as public goods, property rights regulation is often a pre-requisite for developing new markets. Large experience in this field has been gained in Southern and Central European countries. A common legislative frame related to property rights of NWFP&S, at least at EU level, could help in supporting the development of entrepreneurial initiatives.

⁶ The FSC defined "Non Timber Forest Products" (NTFP).



Figure 9 and 10. Examples of certified products: Christmas trees certified by FSC in Switzerland (WWF 2005), and *Pinus mugo* aromatic essence certified by PEFC in Italy (PEFC 2006).

Local, State and international regulations can sometimes create good opportunities for product differentiation as in the case – already mentioned – of the EU certification of origin, but there may also be serious problems connected to the compulsory respect of quality and sanitary standards.

Providers of NWFP&S need to keep themselves up to date on these issues. Private consultants and public advisory services may play an important role on this matter. Although individuals and SME's may have limited opportunity to influence changes, if they stay informed they may be able to adjust their operations accordingly thus minimizing the overall effect.

Integration and networking

A well working network gives the possibility for companies to work on their special areas of expertise. This helps to avoid risks of investments and limited resources can be use to develop high quality of the products and services, (e.g. nature tourism enterprise in Finland – primary clients are travel agencies, not the consumers themselves; Ollonqvist et al. 2005).

Human resources and social capital

To find qualified staff is often a challenge for producers, especially when very traditional techniques are required to gather the products. For example in the truffle industry,

very well educated dogs and people with a good knowledge of the sites are crucial for success. The location of the best places for truffle collecting was often a guarded family secret and passed down from one generation to another. Nowadays more than 30 % of the truffle collectors are pensioners and older than 60 year (Pettenella et al. 2005). There is a danger that old traditions are dying out.

Promotion

Marketing must be directed at the target group(s). This is especially true when the service is located in an area that is remote to the target group. For example many nature tourism enterprises are working on an international level with foreign clients. It is consequently of utmost importance that the publicity be done at a period when the consumers are planning their trips. One of the factors effecting the enjoyment of these types of experiences is often the availability of information on a cluster of well coordinated products and services. The consumer should not only have direct and friendly access to information, but the gathering of this information and planning his/her activity should represent a positive experience. Often the planning time of the consumer is considered off time by the service provider. This is, however, a mistake. Unanswered phone calls and emails will send otherwise interested clients to providers who do provide answers.

Selling systems

Small production amounts are a problem for marketing and logistics. New selling systems, like e-business help to overcome these problems and to limit transportation costs (e.g. truffles in Italy - see Figure 11). The advantages of e-business are:

- Time saving: virtual offices are open 24 hours
- Minimization of mistakes in information flow
- All business partners on the same information situation
- Effective and fast communication
- Accessibility by distant consumers
- Reduced cost of sales
- Getting further market information easily

A direct to consumer approach is often utilised by small scale or family run operations where produce is sold at roadsides or farmers markets. Many NWFP are sold on 'black' or 'grey' markets – for example large parts of truffle production and trade are unknown.



Figure 11. Example for e-business: On-line market for truffles (Italy) (Internet 8).

Climatic conditions

Poor weather can effectively shut down a business based on outdoor recreation. It is therefore imperative that appropriate measures be taken to insure funds to tide the business and its staff over such times.

Taking into consideration the role and importance of these key factors of marketing development it may be understandable why the same product or service may be in one market a well differentiated, profitable business opportunity and in another, relatively closed market, a product of low market significance and a missed opportunity for local development. The comparison of the mushroom business in Italy and Hungary presented in Table 6 gives evidence to this statement.

Table 6. Italy-Hungary forest mushroom business comparison.

| Benchmark | Italy | Hungary |
|---------------------------------------|--|--|
| Labelling | Well developed, especially in Borgotaro area. | No real packaging background. |
| E-business | Well developed, especially in truffle business. | Little initiatives can be observed. |
| Value-added processing on local level | Well developed. The processing fits to the request of supermarkets. | 90 % of Hungarian harvest leaves the country in fresh. |
| Improvement of regional, home market | Well developed. Each supermarket has many forest mushroom products (cans, powder etc.) | Since mid 90's some home market interest can be observed, but 99 % of customers prefer cultivated mushrooms. |
| Support services | They exist, especially in truffle region. | No innovation in this field at all. |

3.3. Complementary products and services

Complementary products are generally seen in marketing literature as the products that can be manufactured together, sold together, bought together, or used together.

Economically speaking, they are products whose demands are positively related and one aids or enhances the other (see American Marketing Association 2006, Shocker et al. 2004). Complementary services are seen as additional services in the service or product package that individualise the main service or product and enhance its competitiveness (e.g. Grönroos 2000, Maaseutumatkailun yritystoiminta 1993).

Complementarity is a concept strictly connected with the idea of a linkage; in the markets there are different forms of links among products and enterprises. In NWFP&S marketing a fundamental link is that among products and services that have a specific territory in common. This is the field of interest of a new branch of marketing: the so-called territorial marketing whose objective is to bundle marketing efforts for the coordinated promotion of specialties from the same area, for example through roads and paths linking different enterprises sites, through exhibitions, fairs and markets, or through a common promotion policy.

Product/service development

Complementary products and services create competitive advantages to product or service development by (1) providing added value to the main product (see e.g. Grönroos 2000, Sengupta 1998, Shocker et al. 2004) or (2) they form new products, when combined with other products or services (Figure 12).

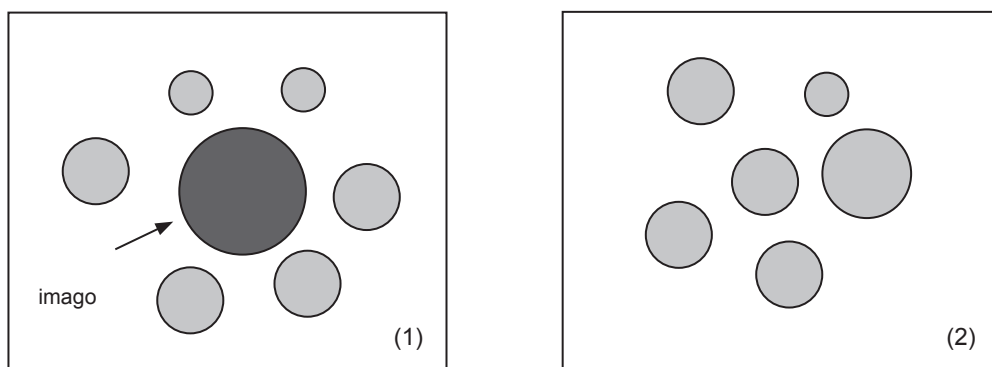


Figure 12. Different kind of combinations of the main products/services and complementary products/services interaction.

On the left is presented the situation (1) where complementary products provide added value to dominating main service or product with imago value (e.g. see later in the text: Trails of chestnuts in Italy, Coillte in Ireland, Biking tours in Wales; Pettenella et al. 2005, Slee et al. 2005). As is the case in (2) above, on the right there are a number of products and services which together create a new product with added value or marketing attractiveness that exceeds the value of the individual products or services (Box 4).

Box 4. Arnica Montana Co (Mészáros et al. 2005, Internet 13)

Arnica Montana Co is an example of a micro firm in Hungary specialising in forest recreation and ecotourism service. They have different programs for adults and children. It uses common images and values to combine different kinds of basically simple services like meditation, physical exercises etc. and link it to the forest environment. They created a successful weekend package called “revival with the power of nature”.



Strong imago-based benefits can be provided for example by different kind of major nature attractions like the national parks. They are in many cases reasonably well known and are marketed by the manager of the park (often a public actor) via different media. National parks have a well-known imago of their own. This brings significant added value to the other non- commercial or commercial services (e.g. nature guiding or accommodation services inter alia) related to the parks, when marketed. For example in Ireland the State owned company called Coillte has included very basic, non specialised accommodation services to the recreational possibilities offered by

public Forest Parks and is marketing them with the brand of 'Forest holidays'. The complementary services in this case are the accommodation services. The cabins themselves would not attract so many customers. They are selling well because of the surrounding landscape and its recreational opportunities, which are the main services bringing the people to the area. Moreover, since the same actor provides both complementary and main services, there have not been conflicts of interest.

In Wales, in the forest of Coed y Brenin, the biking routes were set up by the public organisation. They have the similar kind of free, public provided main product role like the national park in Ireland. However in this case the providers of the biking routes did not provide any ancillary services. They were left to be provided by private companies, which brought significant benefits to the tourism companies and regional development of the area, not only one company or actor (Slee et al. 2005).

The main product or service can be, as well as the complementary products and services, both free of charge and chargeable (Figure 13). One very basic example of complementary products free of charge can be attractive surrounding nature. For example scenery can provide valuable competitive advantages to the nature tourism companies in the area.

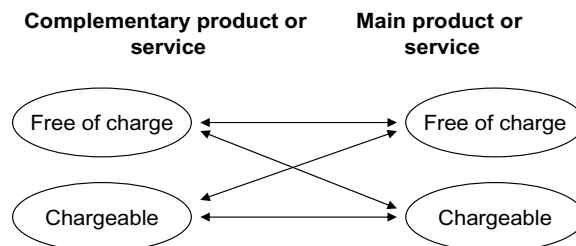


Figure 13. Possibilities of combination of chargeable and free of charge products and services.

In some cases both main product/service and complementary product/service can be free of charge. For example a national park can be combined with free public complementary services. It can also be combined to chargeable public supported complementary services (e.g. guiding services), which can be delivered cheaper than market price due to public support. Sometimes these services are competing with the similar kind of private services in the area. To succeed the entrepreneurs

utilising these areas need to specialise their products so that the public services do not compete at the same markets with their services.

Complementary services or products need to properly support the main product in order to create significant added value and to increase competitiveness. It requires careful product development to meet the needs of target groups they are intended for. This is often forgotten as for example in the case of biking tours in Finland: a rural accommodation company made a biking tour package to complement their service supply. The packages included visits to cultural attractions of the area. The tour packages were carefully designed, but they did not sell properly and there was practically no interest towards them among mainly domestic customers. It was not taken into consideration that most of the customers were very self-reliant family holidaymakers, who came with their own car, were mainly looking for relaxation from their holiday and were not so interested in the cultural attractions in the area.

Innovation

In some cases the complementary services or products can help to diversify the nature of the main product so that it can be targeted to new customer groups. Also by combining several complementary services it is possible to create totally new innovative products (e.g. Arnica Montana Co, Box 4).

In some cases the products/services can be successful also alone, but combining them as a package gives added value. A good example of a new product is the 'Days of chestnuts' in South Tyrol (Italy, Box 5).

Quality assurance

Since complementary products and services are typically very dependent to the main product or service, the quality image of the main product is usually connected also to the complementary products. On the other hand this means that complementary products combined to the main products have to meet at least the same quality standards. Sometimes the provider of the main product can also expect certain values and codes of good practice to be followed by the providers of complementary services. One good example of this is a birdwatching company Finnature Oy Ltd. (Finland), which provides high quality tours to very selective customers. They choose very carefully the providers of the needed complementary services and also expect environmental responsibility from them, since that is one of the main marketing advantages of the company (Ollonqvist et al. 2005).

In some cases, the complementary products or services can provide some kind of quality status to the main service as well. This is closely linked to the imago value of the complementary service or product.

Box 5. Chestnut fair in South Tyrol (Italy) (Internet 12):

In the region of South Tyrol in Italy, chestnut maturity and the first wine of the year take place at the same time. Every year different chestnut fairs are celebrated. Tourists are attracted with Chestnut-trails and visits to agriculture farms to eat fresh roasted chestnuts, taste the new wine and other local specialities. Many old chestnut recipes were rediscovered and are utilised during these days. Tourists can also learn everything about chestnuts from woodland to gastronomy on chestnut walks and chestnut parties.

The screenshot shows the Lana website interface. At the top left, the 'Lana' logo is displayed in red, with the text 'Valle d'Adige - Valtenes - Regional-Geopark in Maresio Land' below it. A map of the region is visible. To the right is a photograph of roasted chestnuts. Below the map, there are logos for 'MILANER LAND' and 'SÜDTIROL'. A 'Newsletter' section on the left contains a registration form with the text: 'We are happy to keep you informed about the latest NEWS when it comes to making holidays in Lana. Please register here!' and a 'Your e-mail' input field. Below that is an 'Order hotel guide' section with a form and a small image of a building. At the bottom left, there is an 'Address' field. On the right side, a 'Highlights' section features a large graphic that reads 'KESCHTN RIGGL' in a stylized font. Below this graphic, the text reads: 'Chestnut fair 2006', '21.10 - 29.10.2006', 'Place: Valten and Tignes', and 'Date: Saturday, 21.10.2006 - Sunday, 26.10.2006'. A paragraph of text follows: 'This week our guests learn all there is to know about the chestnut's significance from woodland to kitchen. The chestnut was once part of local farming life. It was ground into flour and baked into chestnut bread. Old recipes from these days have been rediscovered, chestnut bread traditionally baked in old stone ovens, and farmers' wives at the market sell chestnut pasta and other chestnut treats. Chestnut walks, "Keschtnfest" (chestnut party), talks and conducted tours all open our eyes to this special fruit. Culture, gastronomy and tradition meet in this special event.'

Regulations and property rights setting

Nature attractions used to cumulate the added value to the main products or services can be located on public or private land. Sometimes the land owner and service provider can be the same actor, but this is not always the case. Taking e.g. tourism into consideration, land management of the area requires close and well- functioning co-operation between the entrepreneurs and the landowners. This highlights the role of property rights and distribution of the profit especially in the private land areas. Influencing land management can be very difficult for the entrepreneurs who are utilising these areas (e.g. landscape) in creating additional value to the main products.

Regulations and property rights setting is also an issue, when complementary services are used to complement the service supply of the main product and are used

as a competitive advantage. In addition to attractive surrounding nature, the proper biking or hiking routes can provide valuable competitive advantage to the nature tourism companies in the area and create some extra services to the actual product e.g. accommodation services. The possibilities to access this kind of complementary services in many cases depend on country and region specific regulations.

Integration and networks

Since complementary products are tightly connected to the main product or are a part of product package, close and well functioning co-operation is essential for the success of any kind of complementary product or service. Sometimes the main and complementary products are provided by the same producer (public or private) like in case of Coillte, Ireland. This reduces the potential of conflict between different actors. In many cases, e.g. in the case Biking route Coed y Brenin in Wales (Slee et al. 2005) the property owner or supplier of the main product/service and complementary products is not the same actor. Those cases especially highlight the role of good will, property rights and equitable profit distribution between the actors. Clear agreements of the responsibilities and privileges of each partner are one way to support this development. Also the commitment of all actors to the common production and agreed quality are essential. In case of Coed y Brenin the driving forces concerning commitment were the private suppliers of complementary products and services, who organized in chains to provide different linked services which results in multiplying benefits to the whole area.

In order to form well functioning co-operation among the different actors for successful complementary products, the role of networks e.g. associations and institutional actors is often highlighted (Figure 14). The role of the networks can be in establishing the co-operation in first place, operating as trustee or organising the marketing and selling the joint product/service packages like in Norway, where the association for rural tourism in Norway, Norsk bygdeturismelag NBT has been trying to establish an independent trade organisation in the sector (Lunnan et al. 2005).



Figure 14. Network of local municipalities in Italy – Italian national association ‘Towns of chestnut’ (Associazione Nazionale Città del Castagno).

Promotion

As already mentioned, in many cases complementary products and services are marketed jointly with the other product/service based on a common, well differentiated, territory. This provides more visibility to the products as well as reduces the marketing costs for individual products. The experiences of the case studies indicate that the territorial marketing of NWFP&S is concentrated in Central and Southern parts of Europe whereas it is possible to find more sectoral aspects than in Northern Europe.

In NWFP&S sector SME's are prevailing and the end customers of these companies are often urban maybe even foreigners. With limited financial resources and competences, it is often very difficult for small companies to reach customers' awareness. Joint marketing creates synergies among different suppliers. In some cases there is a possibility to use an existing customer base for new or revised products or to use the same production and marketing chains for different kind of products.

The principle role of complementary products is to add value or competitive advantages to the main product. This may be used to enhance marketing and promotion campaigns. The complementary products can provide the desired imago for the main product which in turn help differentiate it from competitors. A good example are the chestnut days in South Tyrol (Box 5). The imago of chestnuts is strongly used in promotion. Vice versa the main product with strong imago can help to promote the complementary products as well like the cabins under the Forest Holiday brand in Ireland.

Complementary services and products must fit into the agreed imago. Some aspects of the imago of the main service can also have negative impacts to the complementary services. For instance in the case of the national parks, there can be conflicts with different kind of interest groups whether to build the imago towards a conservation area or a tourist destination.

Complementary products and services offer a potential alternative to NWFP&S to reach markets and create earning logic to those products or services that are traditionally called non-marketable or non-chargeable e.g. scenery or landscape. The risk is, that complementary products and services are usually very dependent on the main products or services in every aspect, especially if they would not succeed alone in the markets. The providers can be equate with subcontractors and when they are complementing a strongly dominating main service or product, the power they have in production or marketing chain is marginal. This highlights even more the

need for clear agreements and sharing responsibilities as well as the trust and open knowledge exchange in the production and marketing channels.

Different kind of products can be united under one label or trademark. Examples for this can be found in the tourism branches for instance the trademark Slow Travel® for rural tourism to experience culture and lifestyle or LanaQuality to improve the quality in the holiday region Lana (South Tirol, Italy) and surrounding area (Internet 10, Internet 11).

Climatic conditions and seasonality

Diversifying the offered products and services by using complementary products or services can help to extend the season for the main services such as hunting tourism has done in many European countries for farm tourism companies. Complementary services can also provide alternatives for different kind of product packages, for example, nature tourism flexibility can be increased by the association with services not conditioned by weather conditions. Via complementary services it is also possible to fully utilise the whole potential of the recreation area like in the case of the Cozia National Park in Romania, where the main product is successfully complemented by a combination of free of charge and chargeable religious-cultural-educational services. In this case it is the park that accommodates organized pilgrimages, school-outings etc. deemed to make the best use of the religious, cultural or archaeological sites located in the park. The wide range of uses of natural resources can however lead to competition either between activities or user categories and cause conflicts with different kind of interests - nature conservation or tourist attraction.



Figure 15. Promotion of different activities through Internet in Cozia National Park (Internet 9).

Table 7 summarizes advantages and risks for complementary NWFP&S. They provide a wide range of possibilities to overcome some of the main problems in NWFP&S sector, like small production amounts, long distances to the customers, seasonal nature and lack of resources. However, to be successful complementary NWFP&S must be as carefully developed as any kind of products, which requires a lot of knowledge both on product or service characteristics as well as customer needs and demands. The role of networks is typically important for micro companies in general, but it is especially highlighted when complementary products or services are concerned.

Table 7. Possibilities, risks and obstacles concerning complementary products in NWFP&S.

| Possibilities | Risks/obstacles |
|--|---|
| <ul style="list-style-type: none"> • Provides more possibilities for micro entrepreneurs to reach markets/target groups • For small companies way to centralise the limited resources correctly • Synergy advantages (use of same production and marketing channels, existing customer base etc.) • More resources (money, knowledge and time) for marketing efforts. • Possibilities to combine products and services over the sector borders → new product possibilities. • Can create the earning logic to so called non-marketable NWFP&S. • Can create the needed added value e.g. to mass products (e.g. raw material or products with low added value). • Can create a competitive advantage for products/ services of low differentiation level. | <ul style="list-style-type: none"> • Transaction costs, need to define clearly sharing of the responsibilities (need for clear agreements) • Strong dependency on the main product/ service → susceptible to market fluctuations of the main product (trends, imago) → providers can 'loose the power' in marketing and production chains to the provider of the main products • Lack of integration with the main product/ service during the product development • Unequal profit distribution • Malfunctioning networks |

4. CONCLUSIONS

The sector of NWFP&S includes a large variety of both products (from food products to handcrafts) and services (from recreation to funerals). It is connected with many branches of the economy and of social life such as the food industry, education, recreation and tourism, decoration, medicine and health care, sport, and as extreme examples art and music. Both marketable (food specialities, nature tourism packages) and non-marketable (landscape, clean air, biodiversity) products and services are supplied as NWFP&S. Different systems of property rights regulation influence the marketing potential of NWFP&S in different socio-economic contexts. Each product

or service requires a different marketing strategy. Therefore it is very difficult, if not impossible to lay down rules that would apply to the whole sector.

Taking into consideration these constraints, on the basis of the analysed case studies it is possible to make the following concluding remarks.

The whole sector in general can be seen as very product oriented. There is a clear need to change the approach to more customer oriented direction. Market research to obtain precise information on customer needs and demands will be necessary to bring about this change. Since in some cases small and micro enterprises in rural areas cannot access this information alone, public institutions could support this development. Those actors, who have the knowledge and 'access to customers' in the marketing channels, so called gatekeepers of the marketing intelligence, play very important role in this process.

To increase the possibility of commercial success in mass product enterprises, producers need to develop greater product differentiation and move up the value chain towards more innovative specialised production.

A very important tool for successful marketing is the control of quality. This leads to standardisation and trademarks of mass products and to different kind of certification systems for specialized products.

The smaller the business and the smaller the customer group, the more important organization in production and distribution become. However market research and promotion can play just as important a role in generating success. Integration and networks can be created through producer/ grower associations, external institutions, partnership and coordination of initiatives between public authorities and private operators. Territorial marketing is one form of effective support. Highest forms of this development are product packages sold as complementary products. This requires high organisational efforts and indicates that there is need for organisational innovations.

Regulations and property rights vary from product to product and from country to country. Services which are until now 'free of charge' or non-marketable give market value to complementary products and services.

A lack of qualified staff in rural areas can be seen as a general issue for all NWFP&S. Fast selling systems and the use of e-business are important for all product categories, especially for perishable products.

External factors like climatic conditions, pests and diseases and the seasonality of demand of raw material supply are problematic for nearly all NWFP&S. The best possibility to overcome these risks is given by complementary products.

REFERENCES

- Burrows, J. and Sanness, B., 1998. The competitive climate for wood products and paper packaging. The factors causing substitution with emphasis on environmental promotions. Joint FAO/ECE Team of Public Relations Specialists in the Forest and Forest Industries Sector. Living Forests, Oslo.
- Campos Palacin P., 1993. Valores comerciales y ambientales de las dehesas espanolas. *Agricultura y Sociedad* 66:9-41.
- Ciccarese, L. and Cascone, C., 2006. Marketing carbon sink. Presentation. COST E30 meeting – Economic integration and urban consumers' demand and rural forestry production. Viterbo, 13-15 January 2006.
- Collier, P., Short, I. and Dorgan, J., 2004. Markets for non-wood forest products. COFORD, Dublin.
- Dhubháin, A.N., Gallagher, R., Whelton, A. and Wiley, S., 2005. Ireland. Country studies. In: Jáger, L. (ed.), 2005. COST E30 Economic integration of urban consumers' demand and rural forestry production. Forest sector entrepreneurship in Europe. *Acta Silvatica & Lignaria Hungarica*. Special Edition 2005. 347-375.
- Essmann, H.F., Andrian, G., Pettenella, D. and Vantomme, P., 2005. Influence of globalization on forests and forestry. IUFRO Congerss. Brisbane.
- FAO. 1995. Edible nuts. Non-wood forest products for rural income and sustainable forestry. No. 5, FAO, Rome.
- Finnish Ministry of the Environment, 2002. Ohjelma luonnon virkistyskäytön ja luontomatkailun kehittämiseksi. *Suomen ympäristö* 535. 48 p. In Finnish.
- Grönroos, C., 2000. Service management and marketing: A customer relationship management approach. John Wiley & Sons, Inc. 563 p.
- Helles, F. and Thorsen, B.J., 2005. Denmark. Country studies. In: Jáger, L. (ed.), 2005. COST E30 Economic integration of urban consumers' demand and rural forestry production. Forest sector entrepreneurship in Europe. *Acta Silvatica & Lignaria Hungarica*. Special Edition 2005. 145-170.
- Honkala A.M., 2001. Oulangan kansallispuiston kävijätutkimus 2000. Naturpolis Kuusamo koulutus- ja kehittämispalvelut. *Tutkimuksia* 2/2001. 88 p. In Finnish.
- Jäger, L. (ed.), 2005. COST E30 Economic integration of urban consumers' demand and rural forestry production. Forest sector entrepreneurship in Europe. *Acta Silvatica & Lignaria Hungarica*. Special Edition 2005. 811 p.
- Kotler P., Armstrong G., Saunders J. and Wong V., 1996. Principles of marketing. Prentice Hall, Upper Saddle River.
- Kelly, J. and Whelton, A., 2004. Cut foliage market study UK and Holland, 2003. Bord Glas, Dublin.
- Lober, D.J. and Misen, M.D., 1995. The greening of retailing. Certification and the home improvement industry. *Journal of Forestry* 93(4):38-41.
- Lunnan, A., Barstad, J., Mitchell-Banks, P., Nyrud, A.Q., Størdal, S. and Vennesland, B., 2005. Norway. Country studies. In: Jáger, L. (ed.), 2005. COST E30 Economic integration of urban consumers' demand and rural forestry production. Forest sector entrepreneurship in Europe. *Acta Silvatica & Lignaria Hungarica*. Special Edition 2005. 485-508.
- Luostarinen, M., 2005. Ekologinen klusteri ja innovaatiopolitiikka. Ecological cluster and innovation policy. *Maa- ja Elintarviketalous* 70. 288 p. In Finnish.
- Maaseutumatkailun yritystoiminta. 1993. Matkailun koulutus- ja tutkimuskeskus. 159 p. In Finnish.

- Mantau, U., Schraml, U., Kastenholz, E. and Brogt, T., 2005. Germany. Country studies. In: Jáger, L. (ed.), 2005. COST E30 Economic integration of urban consumers' demand and rural forestry production. Forest sector entrepreneurship in Europe. Acta Silvatica & Lignaria Hungarica. Special Edition 2005. 245-296.
- Mantau U., Wong, J., and Curl, S., 2006. Towards a Taxonomy of Forest Goods and Services (FOGS). In: Niskanen, A. (ed.) Issues affecting enterprise development in the forest sector in Europe. University of Joensuu, Faculty of Forestry, Research Notes 169. Pp. 285-298.
- Matilainen, A. and Aro, M., 2002. Luontoyrittäjyyteen liittyvät mielikuvat. Helsingin yliopiston Maaseudun tutkimus- ja koulutuskeskus, sarja B:24. 159 p. In Finnish.
- Meadley J., 1989. The commercial implications of new crops. In: Wickens G.E., Haq N., Day P. (eds.). New crops for food and industry. Chapman and Hall, London. Pp. 23-28.
- Mendes, C. and Feliciano, D., 2005. Portugal. Country studies. In: Jáger, L. (ed.), 2005. COST E30 Economic integration of urban consumers' demand and rural forestry production. Forest sector entrepreneurship in Europe. Acta Silvatica & Lignaria Hungarica. Special Edition 2005. 555-642.
- Mészáros, K., Jáger, L. and Hegedüs, A., 2005. Hungary. Country studies. In: Jáger, L. (ed.), 2005. COST E30 Economic integration of urban consumers' demand and rural forestry production. Forest sector entrepreneurship in Europe. Acta Silvatica & Lignaria Hungarica. Special Edition 2005. 297-333.
- Merlo, M. and Croitoru, L. (eds.) 2005. Valuing Mediterranean forests: Towards total economic value. CABI, Wallingford. 406 p.
- Nilson, T.H., 1992. Value-added marketing: Marketing management for superior results. McGraw-Hill Marketing for Professionals Series. 189 p.
- Ollonqvist, P., Aarne, M., Hänninen, R., Kallio, M., Kärnä, J., Karppinen, H., Packalen, K., Rimmler, T., Toppinen, A., Kajanus, M., Matilainen, A., Rutanen, J., Kurki, S., Peltoniemi, J. and Saarinen, J., 2005. Finland. Country studies. In: Jáger, L. (ed.), 2005. COST E30 Economic integration of urban consumers' demand and rural forestry production. Forest sector entrepreneurship in Europe. Acta Silvatica & Lignaria Hungarica. Special Edition 2005. 171-243.
- PEFC. 2006. Newsletter, February 2006. Sul mercato italiano il mugolio certificato PEFC. PEFC Italia.
- Pettenella, D., 2001. Marketing perspectives and instruments for chestnut products and services. In: Heiniger, U. Castanea sativa: pathology, genetic resources, ecology and silviculture. Forest snow and landscape research 76(3).
- Pettenella, D., Klöhn, S., Brun, F., Carbone, F., Venzi, L., Cesaro, L. and Ciccamesse, L., 2005. Italy. Country studies. In: Jáger, L. (ed.), 2005. COST E30 Economic integration of urban consumers' demand and rural forestry production. Forest sector entrepreneurship in Europe. Acta Silvatica & Lignaria Hungarica. Special Edition 2005. 383-435.
- Rural Policy Programme 2005-2008, Finland (Elinvoimainen maaseutu – yhteinen vastuumme, Maaseutupoliittinen kokonaisuohjelma 2005-2008). Publications of Rural Policy Committee 10/2004.
- Rutanen, J. and Luostarinen, M., 2000. Luontoyrittäjyys Suomessa. Alueelliset verkostot: Luontoyrittäminen, matkailu- ja maaseutuklusteri -hankkeen

- loppuraportti. Maatalouden tutkimuskeskuksen julkaisuja. Sarja B 23. 65 p.+4 app. In Finnish.
- Ryymin, J., 2005. Matkailun ohjelmapalvelut, toimialaraportti 14/2005. KTM:n ja TE-keskusten julkaisu. 46 p. In Finnish.
- Saarinen, J., 2003. The regional economics of tourism in Northern Finland: The socio-economic implications of recent tourism development and future possibilities for regional development. *Scandinavian Journal of Hospitality and Tourism* 3(2):91–113.
- Seeland, K., Ballesteros, N. and Berger, T., 2005. Switzerland. Country studies. In: Jáger, L. (ed.), 2005. COST E30 Economic integration of urban consumers' demand and rural forestry production. Forest sector entrepreneurship in Europe. *Acta Silvatica & Lignaria Hungarica*. Special Edition 2005. 695-724.
- Sengupta, S., 1998. Some approaches to complementary product strategy. *Journal of Product Innovation Management* 15(4):352-367.
- Shanley, P., Pierce, A., Laird, S., 2005. Beyond timber: Certification of non timber forest products. http://www.foresttrends.org/documents/publications/Forest%20Certification%20and%20NTFP_11-11-05.pdf
- Shocker, A.D., Bayus, B.L. and Kim, N., 2004. Product complements and substitutes in the real world: The relevance of 'other products'. *Journal of Marketing* 68(1):28-40.
- Slee, B., Ingram, J., Cooper, R., Martin, S. and Wong, J., 2005. The United Kingdom. Country studies. In: Jáger, L. (ed.), 2005. COST E30 Economic integration of urban consumers' demand and rural forestry production. Forest sector entrepreneurship in Europe. *Acta Silvatica & Lignaria Hungarica*. Special Edition 2005.725-778.
- American Marketing Association. 2006. The dictionary of marketing terms. <http://www.marketingpower.com/mg-dictionary.php>
- Yavuz F., Korkmaz F., Birinci A. and Albisu L.M., 1999. An economic overview of the nut sector in Turkey. Economics of nuts in the Mediterranean basin. Proceedings of the seminar of the Sub Network on Economics of the FAO CIHEAM Inter Regional Cooperative Research and Development Network on Nuts, Zaragoza (Spain), 19-20 December 1996. *Options Mediterraneennes. Serie A, Seminaires Mediterraneens* 37:113-126.
- WWF, 2005. Faktenservice No 1 April 2005. FSC Weihnachtsbaum-Aktion 2004 verspricht Erfolg für 2005! 1-2 pp.
- Zajac, S., Golos, P., Laskowska, K., Adamczyk, W., Czemko, B., Jodlowski, K., Kalinowski, M., Lis, W., Staniszewski, P., Zastocki, D. and Janeczko, E., 2005. Country studies. Poland. In: Jáger, L. (ed.), 2005. COST E30 Economic integration of urban consumers' demand and rural forestry production. Forest sector entrepreneurship in Europe. *Acta Silvatica & Lignaria Hungarica*. Special Edition 2005.509-554.

INTERNET

- Internet 1. <http://www.unsd.org/comtrade>
- Internet 2. <http://www.kollnitzer-tannenhof.com/>
- Internet 3. <http://www.conerpo.com>
- Internet 4. <http://www.hedeselskabet.dk/>

Internet 5. <http://www.myplan4ever.de/>

Internet 6. <http://www.artesella.it>

Internet 7. http://europa.eu.int/comm/agriculture/qual/en/prod_en.htm

Internet 8. <http://www.albatartufi.com>

Internet 9. <http://www.cozia.ro/turism.html>

Internet 10. <http://www.slowtrav.com>

Internet 11. <http://www.lana.info/script/pages/site.asp?m1=1812&m2=1844&modId=540&L=en>

Internet 12. <http://www.lana.net/>

Internet 13. <http://www.castanea.hu/arnika/index.html>

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