

Innovation and Entrepreneurship in Forestry in Central Europe

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Abstract

Forestry is constantly changing to adapt to new needs. However, in recent decades the range of demands put on forestry by society, from protecting nature, creating recreational environments, providing renewable resources for the forest sector and employment and income in rural areas have considerably increased. Even more dramatic changes have occurred in the countries in transition. These changes require a range of adaptations and innovations by forest owners and managers, but also – or even more – by those that manage the frame conditions under which innovations can take place. The objective of this report is to describe the actual situation of innovation and entrepreneurship in forestry in Central Europe and their determinants. Empirical evidence was collected through extensive surveys undertaken amongst forest holdings institutional level actors in seven Central European countries as well as through case studies of innovations, undertaken by the research consortium of EFI Regional Project Centre INNOFORCE. The emphasis is placed on the institutional system that is impeding or supporting innovation behaviour. The results show the actual situation in innovation, major shortcomings and some surprising strengths.

1. Introduction

Far-reaching changes are taking place in the social, political and economic systems in Europe with possible consequences for Central European forestry and its institutional arrangements, as well as for rural areas. This is particularly true for the further transition from planned to market based economies in the new democracies, but also the further integration of markets in Europe. Further major changes will concern the shift of activities for many forest owners from their traditional professional background in agriculture and forestry to professions within

manufacturing or services, and the change from a traditional view of a raw material supplier to the provider of a multitude of services. Also the developments in information technology will result in considerable organisational changes in the economic system and administration. All of these and other changes lead to lasting effects on the rules of the game for successful sustainable forest management and raises questions about the design of adequate institutional structures.

Forestry is an important source of income for forest owners and for employees in rural areas. The future of the people, who make a living in rural areas from forestry, will considerably depend on how individuals and institutions react in view of the changes, how forest owners and managers obtain new knowledge and put it into practice in forestry, and how institutions, especially forest administration, extension services, forest research or other institutions best deal with emerging changes. The restructuring of forestry and the development of wood prices tend to have a negative impact on employment. To compensate for the negative impacts, product and service innovations based on the multifunctional use of forest and the efficient use of the growing stock of wood can provide new opportunities for rural employment.

Forest related policies are a national competency, with the exception of some environmental policies of the EU and international conventions and agreements signed by sovereign states. Across Europe these national policies are mainly co-ordinated through the so-called Ministerial Conference on the Protection of Forests in Europe (MCPFE) for 44 European countries and, especially for environment related matters, the EU Community for the EU 15. While forestry is not a main concern of EU-policy, some sector specific EU and national policy areas are quite relevant for forestry. These include:

- rural development policies
- regional development policies
- environmental policies
- innovation and entrepreneurship research programmes
- small and medium size enterprises' (SMEs) programmes.

In forest sector policy, as in other sectoral policy discussions, innovation is specifically discussed in the context of improving the competitiveness of sustainable forestry vis-à-vis other sectors of the economy and vis-à-vis the forest sectors of other countries.

On the EU-policy level, innovation is discussed in the context of increasing the competitiveness of the European economy, creating economic growth, employment and the development of rural regions. Innovation is considered necessary for environmental improvements and sustainable development. It is therefore related to the Lisbon Strategy for employment, economic reform and social cohesion (March 2000) and the Gothenburg Strategy for Sustainable Development (June 2001). The European Union is attempting to improve its competitiveness vis-à-vis other players in the global economy by increasing the innovation activities of European enterprises.

The objective of this paper is to describe the actual situation of innovation and entrepreneurship in forestry in Central Europe and its determinants. The emphasis is placed on the institutional system that is impeding or supporting innovation behaviour.

2. Theoretical Background and Definitions

For the purpose of the research undertaken by the consortium of the European Forest Institute Regional Project Centre (EFI PC) INNOFORCE, innovation is defined as discontinuous intentional change in the inputs, processes or outputs of an enterprise. This understanding of innovation includes changes, which are radical or incremental. Applied to forestry, it includes those changes within forest holdings, which are either new to the firm or new to the market. New to the firm innovations are innovations that can be well established in the market already, however are nevertheless newly introduced in the portfolio of products that a certain firm offers (Rametsteiner, 2000; Kubeczko/Rametsteiner, 2002).

There is a growing consensus in the innovation system literature that innovation is an institutional process (Lundvall et al. 2002, Edquist 2001, Moulaert and Sekia 2000) 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 can support them. A system of innovation has, usually in the context of national innovation system research, been defined by the leading researchers in the field with different areas of emphasis. Some common characteristics of systems of innovation approaches are their emphasis on innovations and learning, interdependence and non-linearity, differences between systems and non-optimality as well as holistic and interdisciplinary approach. Innovation system approaches are considered a conceptual framework rather than a formal theory. Specific analyses in national innovation system research are directed to deepening the understanding of certain types of flows or structures and processes in innovation systems, especially human resource flows, institutional linkages, industrial clusters and innovative firm behaviour. For researching innovation and innovation policies in forestry, the approaches of sectoral innovation systems and regional innovation systems are of particular importance, putting emphasis on the sectoral institutional system in the former or regional networks in the latter.

The surveys were conducted in order to investigate four different levels, as shown in Figure 1. These four levels, namely the personal level, firm level, business-to-business (b2b) and institutions-to-business (i2b) as well as the institutional level were used as the structure for questionnaire development and data analysis in the forest holding and the institutional level survey, as well as the case study analysis.

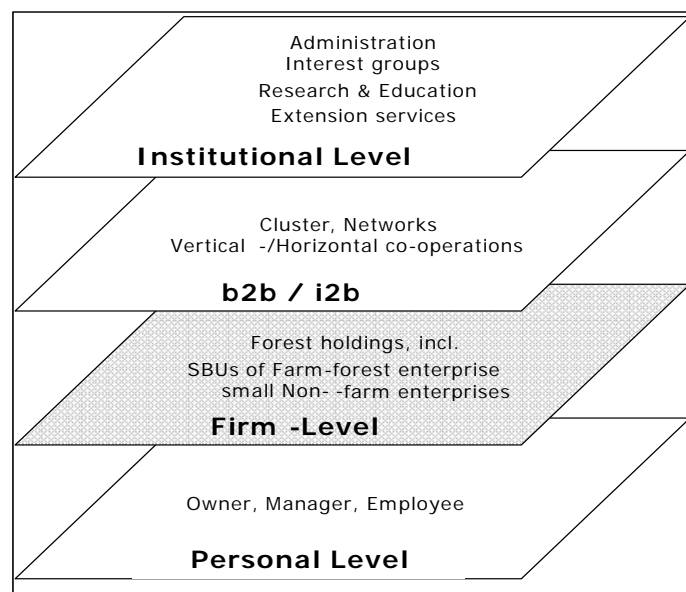


Figure 1: Levels of investigation and data analysis

Edquist and Johnson (1997) summarise the functions of institutions in the process of innovation in three categories:

- to reduce uncertainties by providing information,
- to manage conflicts and cooperation,
- to provide pecuniary and non-pecuniary incentives.

3. The Methodical Approach

For the analysis of the actual situation of innovation and entrepreneurship in forestry in Central Europe, data from 1417 forest holdings were available from seven Central European countries, Austria, Germany, Czech Republic, Hungary, Italy (Trento province), Slovakia and Slovenia. The surveys were conducted nationally, based on a common master questionnaire. Common formats and categories were developed to allow standardised data analysis, especially for responses from open questions (Rametsteiner et al., forthcoming).

Over 70, mostly face to face, interviews with actors of the national level and more than 200 interviews on provincial level were conducted in six countries using standardised and semi standardised questionnaires. The following groups of actors of the sectoral institutional system were included in the survey: governance system (legal authority, administration, interest groups, standardisation organisations), research and education (R&D organisations such as universities and other research institutes, professional education and training), and extension services (consultant engineers/consultants and services by chamber organisations or similar). The analysis of the relevant institutional system for innovation activities in forestry is based on the SIS approach.

In six Central European countries (Austria, Switzerland, Germany, Czech Republic, Slovenia and Slovakia) 32 case studies of successful innovations were conducted. The analysis comprised 18 cases of product innovations (ten wood and non-wood products, of which six on bioenergy, eight cases of services, of which three on nature conservation) and 14 cases of process innovations. A common interview guide was used in data collection. Personal interviews were conducted with the lead actors of the innovations and additional personal or telephone interviews addressed actors of the IS that played a significant role in the innovation process. The analysis focused on the actors and interactions involved, which functions were fulfilled by which type of IS (SIS or RIS) and which factors were impeding or supporting the successful implementation.

4. Frame Conditions for Innovations in Forestry in Central Europe

Frame conditions in forestry are in many respects not supportive of innovations: in the Central European region (excluding Italy) the average size of forest property is around 22 ha. The average size of private property in the region is very small (11 ha) compared to the average size of public properties (>500 ha). Average sizes of private properties in the Czech Republic or in Slovenia are only 3 ha. Of the total number of forest holdings in the region, more than one million, around 98%, are private. Together they manage about 50% of all the forests in the region. This magnitude of fragmentation of forest ownership is an important obstacle to innovation.

Very few people actually work full-time in forest management. Even for property sizes larger than 1,000 ha less than half of the persons interviewed worked full-time in forest

management. Practically all of the work in small forest holdings <100 ha is done by family members, of whom virtually nobody works full-time in forestry. Moreover, in small forest properties forest work is usually not (yet) outsourced. There are strong indications that forest work remains simply undone if family members do not find the time.

Forest owners and managers were asked about their goals for forest management. Figure 2 shows that in none of the five forest holding size classes a majority of forest owners or managers states that he/she manages the forest with the goal to increase profit. However, the share of those managing with a view to increase profit rises from about 10% in very small forest holdings to around 40% in forest holdings larger than 100 ha. About two thirds of very small forest holdings manage their forests in a way to maintain capital. Even in quite large holdings more owners or managers manage for capital maintenance than for increased profit. Only very few forest owners or managers actually aim to sell property or to abandon forest management. This indicates that the property market will not become more dynamic in the foreseeable future in any of the Central European countries.

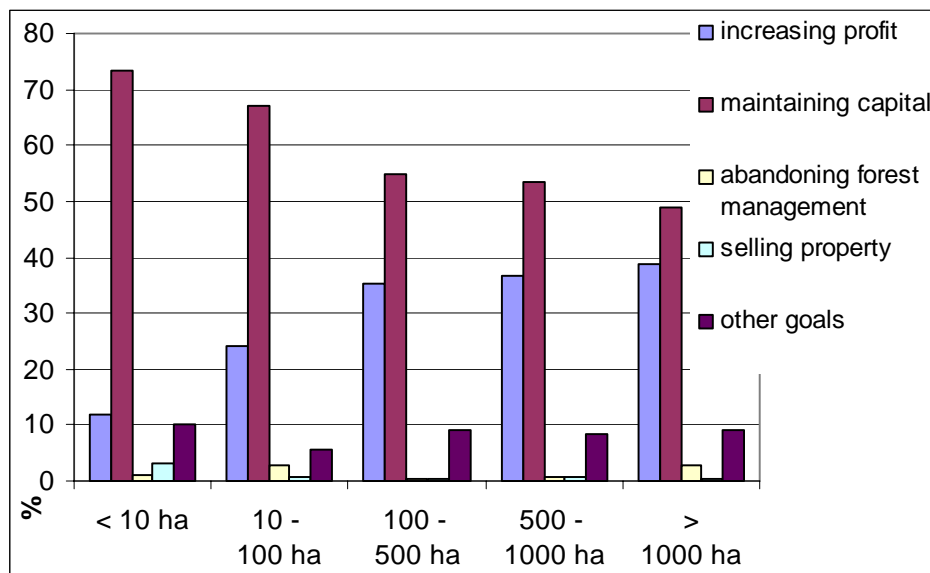


Figure 2: Goals of forest management over forest holding size classes in Central Europe (note: Germany is included from 200 ha onwards)

Figure 3 shows the results of a subsequent question related to the strategies chosen by the respondents to achieve the goals stated just previously. The graph shows the domination of a “business as usual” strategy for all forest holdings up to 500 ha. A solid majority of owners or managers of very small properties states the continuation of their practices as their strategy also in the future. The figure also reveals that the range of strategies chosen by forest owners and managers is quite broad, and becomes more diversified with property size.

In all size classes rationalization and outsourcing are important strategies. These two combined become by far the most important strategy for forest holding sizes >500 ha. Co-operation with other forest holdings is considered or pursued by forest owners or managers across all size classes. The data shows that increased marketing efforts are not at all high on the agenda of managers, despite the often-heard claim of the importance of enhanced marketing efforts. Even the larger forest holdings are lacking a demand-oriented marketing focus and are instead concentrating their efforts on cost cutting.

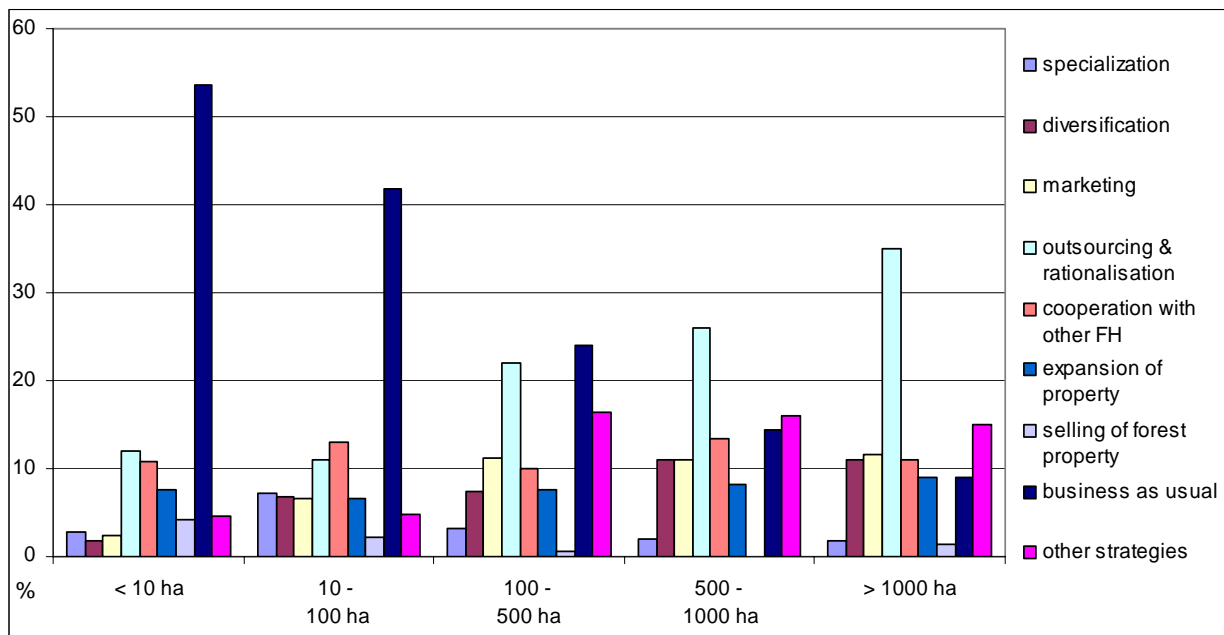


Figure 3: Strategies used by forest owners and managers in forest management in Central Europe (note: German forest holdings >200 ha included)

The product mix offered by forest owners and managers clearly increases over the size of the holding. Small forest holdings rarely offer any other product except industrial wood or wood for bio-energy (if they offer any product at all on the market). With increasing size of the holdings the range of products offered increases. Large forest holdings offer a range of wood products, but often also game and services, especially renting (in some countries often hunting rights). Renting out rights, or offering a service, is the second most often offered “product” by forest holdings.

Usually income from forests is not the main income source for forest holdings. The smaller the property size the lower the percentage of income from forestry. In Austria, forest holdings of sizes over 500 ha generate only about 50% on average of the total income from forestry. The remaining part is to a good deal from income sources other than the primary sector. The share of income from forestry in an average private forest holding of around 11 ha is usually less than 10% of the total income of a respondent. The share of income from agriculture is 40% of total income. Around 50% of total income is from sources other than forestry or agriculture. There is little indication that this situation is much different for private forest owners in other countries.

Yet not all of these factors have an equal bearing on the innovative climate or the inclination of a person to innovate. Nevertheless, each of most of these factors alone would be a structural obstacle for innovation. When more of these come together, they often add up to quite a barrier that individuals have to overcome in order to be innovative. Note that cultural factors, such as an often-lamented conservative and change-resistant culture were not amongst the factors described above. In fact, the evidence collected in the course of this survey, albeit limited, was less pronounced than anticipated.

5. Forest Managers as Innovators

On average, nine percent of the forest owners/managers in Central European (CE) countries have introduced one or more products or process innovations (selling a new product or service or having introduced a new technological or organizational innovation) in the last 3 years. Of the forest holdings >500 ha more than half of all forest holdings, have introduced some innovations during this period.

Figure 4 shows the percentage of forest holdings that have concluded an innovation activity successfully (i.e. not abandoned the attempt) by the size of forest holding. The innovation activity in Central European countries in the last three years clearly correlates to the size of the forest holding. In all countries the percentage of innovative forest holdings larger than 500 hectares is at least 4 times higher than the one of forest holdings with properties smaller than 500 hectares. This clearly shows the difficulties that small forest holdings and small enterprises generally face in their innovation efforts. It, however, also documents the quite high level of activity of larger forest holdings.

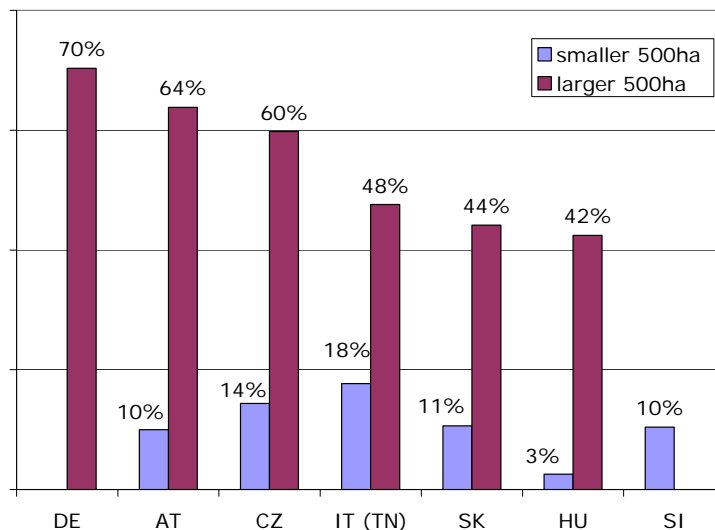


Figure 4: Percentage of innovative forest holdings by forest holding size

The answers on the most successful innovations were analysed and classified into “new to the firm” innovations and “new to the market” innovations and thus to identify ‘novel innovators’ in forestry. “New to the firm” was considered “incremental” innovation and “new to the market” innovation as “radical” innovation-. The classification was done on an expert basis by researchers within the countries. The researchers could not identify any ‘novel innovators’.

6. Institutional System of Innovation

The institutional set-up of the forestry sector is quite different in the Central European region, also on the national level. However, the basic structure of the organisations is similar. In all of the countries, several institutions are key organisations in forest policy.

The results of the survey show that forest related institutions are not in contact with governmental or non-governmental bodies or agencies dealing with innovation policies in the

individual countries. There are no explicit innovation policies formulated or pursued that are forest-related in any of the Central European countries covered. This did not come as a surprise. However, it is still a strong indication that awareness of the need for an innovation-enabling environment is not existent or is in its infancy. Moreover, interaction between institutions constituting the main actors on innovation related aspects is often restricted to or characterized by what could be called “traditional coalitions”. An example is shown in Figure 5 below. If the main actors on the national level forest policies are asked as to which actors they consider relevant for innovation in forestry, interest groups dominate the picture.

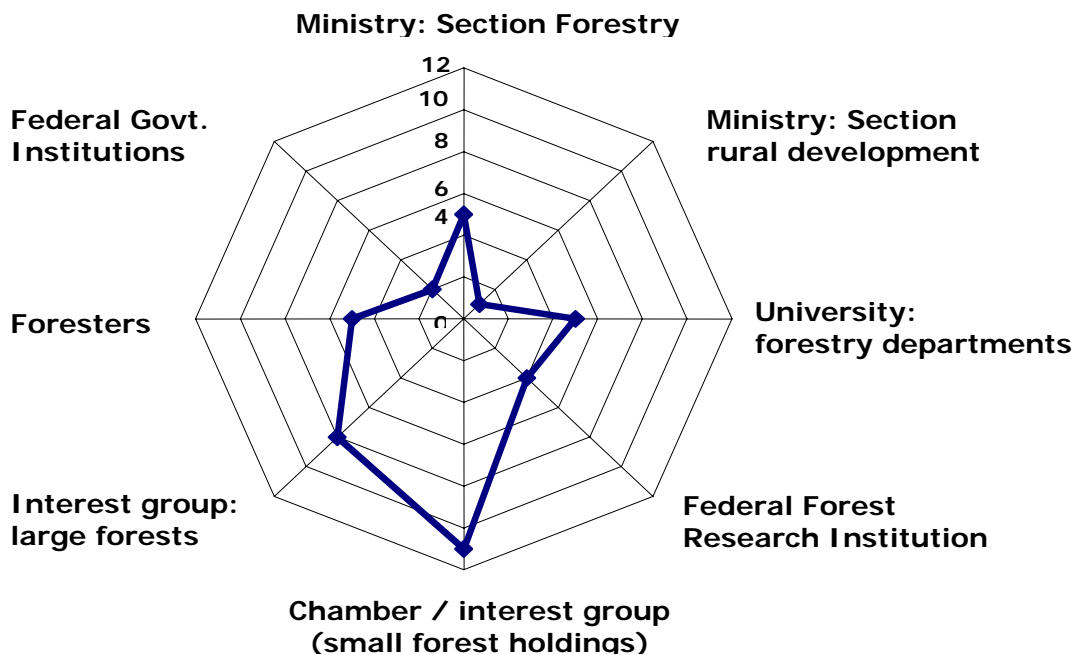


Figure 5: How often national level actors were stated to be important by other actors concerning innovation in forestry in Austria

The forestry institutions perform tasks that fulfil classical functions of an innovation system (providing information, managing conflicts and co-operation, providing incentives for innovation). What seems to be lacking quite often are instruments or support designed to provide incentives for overcoming barriers to change and counteract resistance to change, including sectoral inertia, and the support of the early phases of innovation and the creation of a culture that encourages testing of ideas. Possibly such an approach is considered too “anarchic” by some institutions or actors that prefer a more top-down-planning and managed approach to the development of the forestry sector. What seems to be covered much better by existing policies and programmes is support for areas that have been identified by national level opinion leaders as promising future fields, i.e. the early adoption phase.

7. Discussion: Shortcomings and Surprising Strengths

7.1. Forest Owners: More Innovative than Commonly Perceived?

One can make a range of observations based on the data of the surveys regarding the current situation of innovation in forestry:

1. There is little innovation activity in the sector, especially in small forest holdings.

2. All innovations are incremental and usually not nearly new for the sector.
3. Customers and consumers play virtually no role as a source of improvements of products or services.
4. There is virtually no start-up activity in the sector.

All these points are not new to experts in the sector. These facts have just been confirmed by empirical data. The conclusion that many draw is that any effort to change the situation is to no avail. However, there are a few remarkable facts that can be substantiated by evidence that put this rather pessimistic assessment in a different light:

1. Larger forest holdings (>500 ha) are as dynamic in implementing innovations in their enterprises as an average EU manufacturing SME (although all innovations are incremental).
2. Forest owners in many countries have, at least verbally, an entrepreneurial orientation (although most of them hardly ever become active in forestry).
3. Forest owners usually state to see opportunities for new products and services and, expect more growth of services markets.
4. Indeed, there is more service-related innovation than product innovation in practically all of the countries surveyed, although economic policies are usually not supportive of service related innovations.

These factors imply that a change of the situation is possibly less a question of the willingness by forest owners as one might initially be inclined to think. Given the right conditions forest owners are possibly more prepared and willing to actively pursue market opportunities through innovative approaches than national policy makers often consider them to be.

7.2. Institutional System: Lack of Innovation Policies in Forestry and Poor Innovation System

The forestry innovation system is active in the fields of technological and organisational innovations, and in the diffusion of certain pre-selected innovations. Typical areas of activity are mechanisation of forest work and, recently, the forming of forest owners' co-operations. Except for some selected topics – such as bio-energy or forest education – product and service innovations are rather disregarded. Specific support aiming at the development new product and service innovations are practically missing.

A range of weaknesses is found with regard to the forestry innovation system and related policies: First, the national innovation system does not include forestry matters. There are virtually no interactions between forestry actors and actors dealing with existing national innovation policies. Forest policy institutions and forest knowledge institutions have difficulties to implement or transfer innovation policies (that are designed across a range of sectors) into the forestry sector. Forestry actors hardly know about the programmes and opportunities that these might provide.

Second, no comprehensive innovation policies are formulated for the forestry sector. Although representatives of the forestry institutional system mostly regard the topic of innovation as highly important for the development of the sector, there are no corresponding policies, strategies or programmes. Innovation aspects are handled in diverse operational policies for specific issues, but are not dealt with in a coherent form.

Third, the group of forestry institutions, which is active in innovation related matters, is usually small. Only a few actors are seen to be relevant for innovation aspects by the institutional actors. Often, as in Italy or Austria, forestry interest groups dominate the picture but public administration and research and education institutions are hardly mentioned. Only Slovakian universities and research institutions are regarded as central actors in innovation, however, forest owner's organisations have no significant role there.

Fourth, there is a lack of interaction with actors in sectors where a considerable part of innovations are actually currently occurring (and are expected to occur in the future), namely forest services, including tourism. Forestry institutional systems have strong sectoral boundaries, even to the wood and agricultural sectors, and even more to other sectors such as energy, tourism, nature conservation, etc. Forest policy institutions and forest knowledge institutions are experiencing difficulties in establishing systematic and stable relationships with other sectors that in fact are closely related to existing or potential markets for forest products and services.

7.3. How Well Are the Three Innovation System Functions Fulfilled?

The lack of explicit innovation programmes does not mean that institutions do not fulfil roles that in turn support innovation – they do. According to the classification of Edquist and Johnson (1997) three basic functions have to be fulfilled by innovation systems: reduction of uncertainties by providing information, the management of conflicts and cooperation, and the provision of incentives. This does not mean that each institutional actor has to contribute to each of them; however, the documented cases prove that the innovation processes benefited considerably from institutional support in all of these areas, however coordinated or not coordinated this support actually is.

Provision of Information: Lacking for New Markets and Opportunities

Forestry agencies are important providers of forest-related information. Giving advice is the most prominent service that forestry agencies provide – be they authorities or interest groups. Particularly the case studies, however, reveal that the institutional actors provide good information on traditional forestry topics but information severely lacks for new market fields such as tourism, nature conservation, etc. Only in exemptions, institutional actors have built up new knowledge on new areas, e.g. biomass use.

Another weak point is the distance of the knowledge management system from other institutional actors in many countries, which becomes obvious when looking at the institutional survey and the case study analysis data. There is a relatively low level of interaction between research and education organisations and the forest agencies that have more direct and frequent contact with forest owners and managers in the field. Also the interaction between research and education systems, especially the transfer of new knowledge in education systems, is deemed an area where improvements could be made.

Management of Conflict and Coordination: Weak with Other Sectors

With conflict management and coordination the picture is quite similar to the provision of information: In the coordination among forest owners (i.e. in their traditional core competence area) the institutional actors do well, in the coordination with actors from other sectors, however, they fail. Even the coordination with sectors in the wood chain proves to be difficult. With concern of conflict management and coordination, three specific situations can be distinguished:

Balanced networking and cooperation/coordination within forestry: As already mentioned, in many countries the involvement of forestry actors in the IS is rather unbalanced, in some countries to the credit of interest groups, in other of the public administration. Research and education is often underrepresented, and the information flow between local, regional and national (and supra-national) levels on specific innovation aspects is rather limited.

Intersectoral coordination with the timber and paper industry: A current trend observed in the sector is a closer co-operation among forest owners as well as a closer interaction with the industries following in the wood chain. The main reasons put forward for horizontal cooperation are a necessary rationalisation and the competition with raw material suppliers from other countries. Arguments for better coordination with the timber and paper industries are rationalisation effects through advanced logistic systems. The advantages for forest holdings are seen both in better prices and in stable partnerships through the better service offered (just-in-time delivery of the demanded quantities and qualities of timber).

Cross-sectoral relations to services sectors: One of the major weaknesses of the forestry IS are identified in a poor ability of the sector actors to cooperate with actors from different sectors. Considerable – latent – market potentials for forest owners are seen for new services in sectors such as tourism, nature conservation, natural hazards prevention, energy supply, and others. Even forestry actors see strong societal demands in these fields but efforts for converting these, at least for now, public goods into marketable products or services are hardly undertaken. Frontrunner examples, however, prove that such service innovations can be successfully implemented. Indications point in the direction that these examples do not need to be exceptions but rather are beginnings in promising new markets.

Providing Incentives: Little Consideration of Innovation Support Principles

Political programmes that are relevant for innovation in forestry often have a strong focus on financial incentives. At the same time, as these programmes are usually not designed from an explicit innovation support standpoint, they do not explicitly consider principles of innovation policies, e.g. to systematically support new and risky projects or to limit the support to the starting phase.

8. Conclusions

The importance of innovation as such for the future of the sector was strongly emphasised by policy makers responsible for forestry in all Central European countries. However, the results of the investigation show that explicit innovation policies, strategies and programmes that provide systematically innovation support do not exist for the forestry sector. Current innovation support is piecemeal, fractioned and often not co-ordinated. This issue-by-issue approach foregoes the benefits of a more coherent and comprehensive approach, including the benefits of communicating a single message to forest owners and managers in the sector: there is support for new approaches and ideas. It would considerably strengthen the development of an innovation and entrepreneurial oriented climate within forestry.

For the purpose of strengthening innovation and entrepreneurship in the forestry sector it is therefore recommended to develop an explicit innovation policy, strategy or programme. When developing innovation policies, strategies or programmes, it is important to consider each of the three main functions of an innovation system separately and as a comprehensive whole. The most important areas to cover and the main areas for improvement are the following:

- Provide Information on New Markets and Improve Information Flows
- Include a Cross-sectoral Dimension in the Management of Conflict and Coordination
- Provide Incentives that Systematically Foster Innovation

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