



Analysis of the sectoral innovation system for forestry of the Czech Republic. Does it even exist?



Vilém Jarský

Department of Forestry Economics and Management, Faculty of Forestry and Wood Sciences, Czech University of Life Sciences Prague, Kamýčká 129, 165 21 Praha 6, Suchbát, Czech Republic

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ABSTRACT

The article deals with the implementation of an innovation system (IS) in the forestry sector in the Czech Republic. The aim is to analyse characteristics of selected elements (forest owners, forest policy documents, support measures, related institutions) of that system since 2000 and evaluate all three main functions proposed for IS. The conclusion is that the sectoral IS for Czech forestry is established but the IS does not fulfil all three main functions completely – it provides sufficient supportive functions but the information function fulfils only partially and the conflict management function performs poorly.

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1. Introduction

Forest management practices in a particular country are strongly influenced by the character of the forests being managed and the cultural history of the surrounding area. In Central Europe traditions which value preservation and longevity in particular, are very important. For more than two centuries, this cultural environment has seen the development of approaches which value tradition and longevity and have not changed over time. In this way forestry in the Czech Republic (CZ) became one of the most conservative sectors of the national economy. The conservativeness of forestry could also be documented by unwillingness to integrate programmes from other sectors (Giessen and Krott, 2009). According to Šišák (2007), the traditional (conservative) concept of forest management does not concern forester only; it concerns wider social environment which involves forest management including environmental concept, opinions and activities. However forests can boast of other valuable characteristics, and their multi-function outputs are regarded as the most significant today. The forest is not only perceived as a production environment; it also fulfils a number of social functions and provides many ecosystem services. To maintain such versatility of forest functions at a high level, it is necessary to consider not only the multi-functionality of forests, but also the whole of forest management. As Ingold and Zimmermann (2011) mentioned, in recent years, this sector has had to tackle far-reaching changes taking place in the social, economic and political systems. In many other sectors, implementing diverse methods of innovation is a motor for revival,

and York and Venkataraman (2010) suggest innovative change as an alternative to “returning to a simpler time”.

2. Theoretical background

There are many definitions of innovativeness or innovation in the literature (see Nybakk et al., 2009). According to Nasierowski and Arcelus (2012), a scholarly debate on the definition of innovation has created a dizzying array of differing and sometimes contradicting definitions. For example the World Bank (2006) uses the term innovation to refer to new processes, institutions or ways of working that aim to meet a set of needs or tackle a set of problems. According to OECD (2005), innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations. The issue of innovation has been researched for approximately 80 years; the summary of 3 research traditions was performed by Anderson (2006).

The consensus is that innovation in general denotes the successful introduction of novelties. There are different approaches to studying innovation. One is to study innovation as a linear process, while another is to study innovation as a complex phenomenon from a system's perspective (Rametsteiner and Weiss, 2006b). With a growing importance of social science in the forestry sector, the systemic approach has been increasingly utilised. An innovation system was developed as a policy concept in the mid-1980s (Jacobsson and Bergek, 2011) and in literature it supports consensus in the sense that innovation can be an institutional process (Edquist, 2001; Lundvall et al., 2002; Moulart and Sekia, 2000) and that it is not only entrepreneurs who are responsible for innovation in business.

E-mail address: jarsky@fd.czu.cz.

An innovation system (IS) is a system of institutional settings and relevant factors which influence the development and implementation of innovation or, in other words (Fischer, 2000), a system that aims to create and diffuse knowledge allowing the production of innovation. The concept of innovation systems is a heuristic attempt, developed to analyse all societal subsystems, actors, and institutions contributing in one way or the other, directly or indirectly, intentionally or not, to the emergence or production of innovation (Hekkert et al., 2007). To define an IS, one must define the elements (actors and institutions) that comprise the system, and the links between these elements. Innovation system approaches are considered to be a conceptual framework rather than a formal theory (Rametsteiner and Weiss, 2006a).

Different approaches exist for analysis of IS according to spatial (National or Regional IS), sectoral (Sectoral IS) or technological (Technological IS) focus. Deep analysis of NIS was performed by Lundvall (2010), and increasing attention is paid to RIS (Doloreaux and Parto, 2004; Gerstlberger, 2004; Štěrbová et al., 2014), though as mentioned by Fischer (2000), geographical proximity can be considered as a necessary precondition, but not sufficient on its own, for the existence of a territorially based IS.

There are three fundamental functions of IS defined by Edquist and Johnson (1997): – the reduction of uncertainties by providing information, conflict management and cooperation, creation of pecuniary and non-pecuniary incentives for creation of innovation. The term function is usually used in relation to particular institutions (Galli and Teubal, 1997; Edquist and Johnson, 1997) or to the system as a whole (Carlsson and Stankiewicz, 1991; Lundvall, 1992). For a historical overview see Hekkert et al. (2007).

Galli and Teubal (1997) state that it is important to make a distinction between organisations and functions, since organisations increasingly have multiple roles. They distinguish between hard and soft functions. Hard functions require hard organisations (i.e., performing R&D), while soft functions may be operated by soft institutions (not performing R&D as for instance regulatory entities) and involve catalytic and interface roles only. Hard functions are: (i) R&D activities (public) and (ii) the supply of scientific and technical services to third parties (business sector and public administration). Soft functions include: (i) diffusion of information, knowledge, and technology; (ii) policy making; (iii) design and implementation of institutions concerning patents, laws, standards, etc.; (iv) diffusion of scientific culture, and (v) professional coordination. Even though Galli and Teubal (1997) stress the importance of distinguishing between organisations and functions, the functions are a relatively straight extrapolation from the classic modules present within IS (knowledge development infrastructure, demand side, intermediate infrastructure, and supportive infrastructure).

'Sectoral innovation systems' (Breschi and Malerba, 1997; Malerba and Orsenigo, 1990, 1993, 1995) are based on the idea that different sectors or industries operate under different technological regimes which are characterized by particular combinations of opportunity and appropriateness conditions, degrees of cumulativeness of technological knowledge, and characteristics of the relevant knowledge base. These regimes may change over time, making the analysis inherently dynamic, focusing on the competitive relationships amongst firms by explicitly considering the role of the selection environment (Carlsson et al., 2002). How we define the system boundaries i.e. how to delineate the system and identify the actors within a sector? First the term sector needs to be clarified. There are various perspectives how to conceptualize sectors (Giessen and Krott, 2009). Hubo and Krott (2007) defined 'sector' in the context of three elements: (i) actor-related elements (advocacy coalitions, interests or belief systems, etc.); (ii) political programmes and public policy measures; and (iii) institutional and related procedural compounds. Giessen and Krott (2009) identify so-called 'boundary behaviour', meaning that actors are assumed 'to define, to structure, to identify and to distinguish' sector boundaries. Such 'boundary behaviour' may be explained by beliefs and/or interests and in addition

involves ensuring, defending or even maximizing the given degree of autonomy that sectors have. They further hypothesise that sectors tend to show such behaviour in order not to be coordinated by sector-external programmes, with forestry sector being the case (Giessen and Krott, 2009).

Forestry is not an isolated sector and forests are recognised as one of the most significant environmental elements that ensure wider sustainable development. Since 1997, forestry policy has been regarded as an integral component of rural development policy in the European Union (Elands and Wiersum, 2001). Therefore the results of both environmental innovation (Cooke, 2011; Ghisetti and Rennings, 2014; Horbach, 2008) and sustainable development innovation analyses (Colvin et al., 2014; Sol et al., 2013) can be applied to the forestry sector. There are also various analyses of innovative approaches directly related to forestry (e.g. Segura-Bonilla, 2003; Shanley et al., 2012; Song et al., 2004). Increasingly, research attention is being paid towards innovation in the forest sector (Hansen, 2010). Several studies on sectoral and regional innovation systems have been conducted in the wood industry in Europe (e.g. Rametsteiner et al., 2005). While the forest sector innovation research is primarily focused on the primary and secondary wood industry (e.g. Hansen et al., 2011; Stendahl and Roos, 2008; Nybakk, 2012). However, the systemic approach has been used in only a small number of cases (e.g. Buttoud et al., 2011; Ingold and Zimmermann, 2011; Kubeczko et al., 2006; Nybakk and Hansen, 2008; Rametsteiner et al., 2010; Rametsteiner and Weiss, 2006a; Weiss et al., 2011). More frequently the systemic approach appears in papers dealing with sectors closely related to forest management–timber processing (Alfranca et al., 2014), agro-food (Gagliardi et al., 2014) and crop protection (Schut et al., 2014).

3. Background information on Czech forestry sector

CZ is a Central European country and since 2004 an EU member. Forests cover approximately 34% of the total area of the Czech Republic (MA, 2010). Based on their prevailing function, forests in the CZ are classified into three categories – protection forests, special purpose forests and production forests. The development of forestry after social change in the 1980s and 90s had its own characteristics. In particular, the sector was restructured and transformation of the state estates took place. This transformation took the form of different types of privatisation (coupon, direct sale etc.). What was crucial (and did not happen elsewhere in Europe) however was that this privatization did not concern forestry itself (Kupčák, 1998). Only forest enterprises (including machinery, facilities and other technologies, workers and buildings) were privatized leaving out forest stands and forest land which remained in state property. As a result, a number of private companies emerged providing services to forest owners. Thus the transformation of forest ownership was undertaken through a process of restitution (reprivatisation) only, and was terminated in 2000. The process resulted in the following ownership structure: state forests 60%, individuals 19%, municipal forests 17%, legal persons 3%, and forest cooperatives 1% (MA, 2013), which has not changed significantly since 2000. After 20 years of negotiations, the restitution of church property took place in 2013. It is assumed that 6–8% of the current state of forest ownership will be forwarded to the churches in the next years and thus the restitution process in the Czech forestry will be completed.

When the main dimension of interest is a (existence of the) sectoral innovation system, the determination of the relevant boundaries is an important theoretical or at least methodological issue (Carlsson et al., 2002). As stated above, forestry provides various goods and services. As Giessen and Krott (2009) argue, forestry as an economic human activity does not qualify as a sector, although political programmes on forestry exist. But when applying Hubo and Krott's (2007) definition we can conclude that forestry can be regarded as a sector. Forestry sector in the CZ can be regarded as a specific sector as well because all main

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