COPPICE FORESTRY IN SOUTH-EASTERN EUROPE: PROBLEMS AND FUTURE PROSPECTS

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Coppice forestry in general, including all its variants, is a silvicultural system that is still widespread over many European countries where it covers an area of about 23 million hectares (UN/ECE-FAO, 2000). While in Central and Northern Europe coppice forests comprise just a small share of total forest area (e.g. 70,000 ha in Austria, 2% of the total forest area), in Mediterranean (e.g., 6,822,000 ha in France, 3,397,000 ha in Italy, 1,640,000 ha in Greece) and South-Eastern Europe (SEE) coppice forests make up major parts of the forest resource and comprise between 22% and 58% of forest area (Albania 405,000 ha of coppice forests; Bulgaria 1,750,000 ha; Croatia 512,000 ha; Macedonia 557,000 ha; Montenegro 298,000 ha; Romania 369,000 ha; Serbia 1,456,000 ha). In addition, high diversity of site conditions and vegetation patterns accompanied by the different socio-cultural country specific background has produced a wealth of diverse coppice stands and a variety of management practices.

While 10-20 years ago interest in coppice forest management was low, recently coppice forestry has attracted much attention which is mainly due to the increasing demand for biomass for energy production. This development was triggered by climate change mitigation policies in the wake of Kyoto Protocol (IPCC, 2007; Commission of the European Communities, 2005). With increasing revenues from fuelwood (‘biomass for energy’) coppice forest owners may be able to invest in improved management. However, this may be detrimental with regard to the maintenance of biodiversity and traditional management schemes. Substantial portions of current coppice forests in SEE do not fully utilize the site production potential. Among others, major reasons are (i) degraded stands (stump age, species shift), and (ii) lack of appropriate management concepts unifying traditional management practices and up-to-date scientific knowledge. For instance, despite the long tradition of coppice forestry, the potential of coppice with standards systems to provide both, fuelwood and valuable timber are not yet fully explored (Hochbichler, 2009).

The SEE-ERA.NET project ‘Multi-functional management of coppice forests in South-Eastern Europe: contributions to rural development; maintenance of biodiversity; and climate change mitigation and adaptation in natural resource management’ (http://cforsee.boku.ac.at/) brought together forest research institutions from five countries with
substantial shares of coppice forests and intensive research experience in coppice forest management. Those were: University of Natural Resources and Applied Life Sciences, Vienna (Austria); Forest Research Institute, Sofia (Bulgaria); Forest Research Institute, Zagreb (Croatia); Belgrade University (Serbia); St. St. Cyril and Methodius University, Skopje (Macedonia).

The overall objective of CForSEE was to gather and synthesize available knowledge about coppice forests and forestry in SEE. Specific issues which are covered by this Special Issue are to identify major forest types (EEA, 2006) within coppice forests in SEE (Dekanic et al., this issue), to synthesize past and current coppice management practices in SEE countries (Stajic et al., this issue), to discuss stakeholder interests in coppice forests in SEE (Wolfslehner et al., this issue), to estimate the biomass potential for energy production from coppice forests in SEE countries (Nestorovski et al., this issue) and to discuss the role of coppice forests for maintenance of biodiversity and nature conservation (Vacik et al., this issue).

During project activities it became apparent that there is a variety of terms and definitions regarding coppice forestry which is due (i) to different silvicultural practices in SEE countries, and (ii) to diverging terms in the respective languages. To foster a coherent terminology and common understanding with regard to coppice forestry the following coppice regimes were distinguished.

(i) **Coppice stands** are dominated by stool shoots (sprouting, root sucker) after the regeneration phase, where vegetative and/or generative regenerated trees/shrubs are mixed. Also in coppice systems some seed trees are needed to renew the stands and sustain the reproduction capacity. These seed trees are removed after successful regeneration (after appr. 10 years).

(ii) **Coppice with reserves** is a coppice system where 20-30/ha trees are left not only as seed trees but to produce larger diameters for e.g. sawn timber which leads to a two-aged system for the overstorey and the coppice layer.

(iii) **Coppice with standards** is a combination of coppice system and high forest system revealing uneven-aged and multi-storeyed forest structuring. There are different

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**Fig. 1.** A common context for forestry operations and development of coppice forests

1 = transformation, 2 = conversion, 3 = restructuring
age classes in the upper layer according to the rotation periods representing a multi-aged system.

We encountered substantial ambiguity with regard to coppice with standards and coppice with reserves (compare Nyland, 2002). For instance, a special case are Croatian middle-forests. These coppice types could be seen as a variant of coppice with standards as there are trees of several rotation periods present in the stands. Also, a variety of partly contradicting terms was identified for transformation and conversion operations. As a result of several discussions within CForSEE Figure 1 sets the context for such management activities in different coppice regimes.

As working definition transformation is seen as to move a coppice stand to coppice with reserves where a limited number of selected individuals is grown for at least another rotation period. Similarly, a coppice stand may be further developed into coppice with standards or into high forest, it may just take more time. For instance, to move from coppice to high forest will require at least one or two thinnings in course of the prolonged rotation period, depending on the initial share of trees from seed origin. In contrast to transformation, conversion aims at clearing the current stand and replanting with new tree species. Thus, a high forest may be achieved either by transformation or by conversion. Conversion and particularly transformation are quite general terms. In several SEE countries additional technical terms are used to describe silvicultural treatment concepts in coppice forests. In Bulgaria, for instance, reconstruction is used for a specific case of conversion. In reconstruction the tree species composition is changed, mostly into foreign species, and mostly after site preparation. Reconstruction aims at the total change in tree species, otherwise it is called partial reconstruction. However, in Croatia reconstruction means the enhancement of a given silvicultural system (e.g. a coppice system remains a coppice system but is improved in terms of quality and tree species composition). The latter understanding is also used in Fig. 1. Developing a common understanding of silvicultural terminology in SEE is seen as a prerequisite for understanding current concepts and mutual learning.

Additional issues not covered by the contributions in this Special Issue include, for instance, vulnerability of coppice forests to climate change and the capacity for adaptation. Knowledge gaps concerning improved coppice management systems need to be identified, and based on these findings targeted research should be planned to improve the knowledge base for coppice forestry in XXI century. Some of the traditional practices should be rediscovered and evaluated against ecological, economical and social sustainability indicators of sustainable forest management frameworks (e.g. MCPFE, 2003), and improved by integration of new scientific knowledge. Activities such as CForSEE are first steps which should be followed by concerted cooperative research and demonstration.
REFERENCES


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