The (new) role of public forest administration in Western Balkans: Examples from Serbia, Croatia, FYR Macedonia and Republika Srpska

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The (new) role of public forest administration in Western Balkans:
Examples from Serbia, Croatia, FYR Macedonia and Republika Srpska

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Abstract

Public forest administrations in the Western Balkans were challenged when facing novel forest policies following the breakup of Yugoslavia in the 1990’s. To answer (i) what (formal) goals lead public forest administrations nowadays? and (ii) how do public forest administrations fulfil these goals? we have evaluated the implementation of forest policy goals in Serbia, Croatia, FYR Macedonia and Republika Srpska by using existing criteria and indicators, and the 3L Model as a theoretical basis. Survey and document analysis focused on the effects observable in state and private forests. In state forests all public/state forest enterprises were able to reach goals of being multifunctional and profitable by prioritising marketable goods. Sustaining forest stands is important, but it is met differently in practice. Performance in private forests is much weaker and the influence of ministry departments/sectors is weak. In conclusion, the potential for a new, stronger role of public forest administration exists : (i) the supply of marketable and non–marketable goods could be increased, whereas securing sustained forest stands remains a permanent challenge; (ii) efficiency and profits could be improved if internal and external pressures grow; (iii) joining forces of forestry actors could strengthen the currently weak political role and enable a strong forestry representative to emerge in the future.

Keywords: 3L Model, Western Balkans, public forest administration, forest policy, criteria and indicators
1 Introduction

The territory of the Western Balkans (WB) is mainly known for its turbulent past (Lampe 2000; Veselica and Vojnić 2000; Bartlett 2008), but contemporary information about this dynamic region is rather scarce. Today, the state is still a dominant forest owner – from 53% of Serbian up to 89% of Macedonian forests are state-owned (Table 1). The state typically grants management, exclusion, withdrawal and access rights over these large areas to public forest administrations, which also conduct forest authority tasks independent of ownership (Stevanov 2014).

We consider public forest administration to be public/state forest enterprises managing state-owned forests and ministry directorates/sectors acting as forest authorities. Current WB public/state forest enterprises were all established during the 1990s, when regional forest management enterprises were separated from the wood industry and merged into the country’s centralized enterprise by newly enacted forest laws (Nionić 2004; Savić et al. 2011; Anić et al. 2012). Those were all large enterprises, while centrally planned economies were continuously enlarging their institutions in order to keep up with production plans and control law implementation (Krott 2008b). Control was typically a matter of the Ministries in charge of forestry and wood industry (Nionić 2004). The breakup of Yugoslavia (in the early 1990s), with the follow-up democratization, state building and transition to a market economy (“triple-transition” – Bartlett 2008), challenged all public institutions enormously (Nionić et al. 2011). In each of former Yugoslavian republics, which are independent countries today, reforming processes took their course (Lampe 2000) and the state had to search for a new role. By describing this potential new role Mayntz (2001) pointed at the paradox that “the state should be powerful and effective, but not dominant and overpowering at the same time”, which seems to be an incompatible requirement. Yet, by taking modern forms of governance

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1 The former republics of the Socialists Federal Republic of Yugoslavia, minus Slovenia plus Albania.
as an example, it can be evidenced that this is not so much about the loss of state influence
and control (because the state retains crucial means of intervention), but that the roles and
forms are supposed to change (Mayntz 2001; Howlet et al. 2009; Hysing 2009). In fact, “there
is plenty of evidence suggesting that while the role of the state may indeed have changed to
adapt and accommodate more complex and rapidly changing environments, the dominant role
of governments in these new governance arrangements remains intact” (Capano et al. 2015, p.
312). By assuming that “the state still matters” (Duit et al. 2016, p. 3), we investigate its
(new) role by looking at public forest administrations in the WB and the implementation of
their comprehensive forest-policy goals in the field.

Goals are formulated in forest legislation, strategies, and other constitutive policy parts,
which in the WB have undergone a “substantive change” (see Sadath and Krott 2012). The
new forest laws replaced those from the 1990s, national forest strategies emerged for the first
time and forests rapidly came into the spotlight of inter-sectoral interests. This was
particularly driven by internationally assisted projects, e.g., projects assisted by the United
Nations Food and Agriculture Organisation in Serbia and FYR Macedonia\(^2\). At this time, no
research attempts have been made to evaluate the implementation of comprehensive goals
from these novel policies by public forest administrations in the field, and such information is
crucial for current reforming processes in the WB (Koprić 2011; Baumgartner and
Stojanovska 2014; Stevanov 2014). Recent research on the performance of forest
administrations/institutions/enterprises from particular Balkan countries has covered mostly
economic aspects (Posavec 2006; Delić and Avdibegović 2009; Šporčić et al. 2009; Pajić and
Keča 2017), whereas comprehensive perspectives focused on the acceptance of good forest

\(^2\) E.g. “Institutional Development and Capacity Building for the National Forest Programme of Serbia”,
TCP/YUG/2902(A); “Forestry sector development in Serbia” FAO/GCP/ZUG/003/FIN; “Institutional
development and capacity building in forestry and forest industry sub-sectors” in Macedonia
TCP/MCD/3002(A).
governance principles (Grašić et al. 2011). International/regional comparisons examined reporting practices in state forest organizations (Liubachyna et al. 2017), their structural changes (Teder et al. 2015), authority tasks (Srndović et al. 2014) or the implementation of the forest governance concept (Avdibegović et al. 2012).

In this paper we split our overall research question, about the (new) role of state forest administrations in the WB, into the two particular ones:

(i) What (formal) goals lead public forest administrations in selected WB countries and

(ii) How do public forest administrations in these countries fulfil these goals?

To answer them we have used the 3L Model as a theoretical basis. The 3L stands for the three layers – Program Layer, Theory Layer and Empirical Layer, linking of which enabled an innovative criteria and indicators (C&I) approach (Krott and Stevanov, 2008). After being successfully tested (Stevanov and Krott 2013) and applied in one former socialist country (Chudy et al. 2016), this approach has been used here to generate a comparative view on the (otherwise unknown) comprehensive performance of state forest administrations in the WB. We analysed performance similarities and differences among public forest administrations in four selected WB cases. Furthermore, the analysis included the main (causative) factors relevant for future reform and political action on improved administration performance in light of current EU accession processes.

2 Conceptual framework and theoretical basis

2.1 Public forest administration and its formal goals

Unlike private businesses, activities and outputs of public forest administration are heavily determined by public goals. The theory of political processes conceptualizes these goals as outputs of the policy formulation and sees them as constituting elements of an analytical policy program (Jann 1981; Krott 2005; Sadath and Krott 2012; Logmani et al. 2016). By
that, the analytical program includes a wide plurality of written or oral statements made in a
social context about the subject in question (Mayntz 1980; Jann 1981; Schubert 1991; Krott
2005). In our study we have put together statements of relevance that deal with the WB
forests, generated an analytical forest policy program (Table 3) and identified its respective
priority goals. By assuming that these goals, to a great extent, guide the activities and outputs
of public forest administrations operating in the WB region, we have approached their
performance evaluation.

We consider public forest administration as an organization that makes decisions about
forests and forestry based on general legal standards that resolve problems by implementing
particular measures (Krott 2005; Stevanov and Krott 2013). The “principle of equivalent
functions” (Naßmacher 1991) permits comparison of these organizations in the
implementation of forest policy goals as their “function in common” (ibid.). This way, we
differentiate implementation as related to forest management and forest authority tasks (Table
S1).

2.2 Performance evaluation: the 3L Model as a theoretical basis

In order to avoid the trap of a halo effect\(^3\) (Spendolini 1992, in Stevanov 2014) we gave the
advantage to the comprehensive rather than partial performance evaluation: we judged the
extent to which state forest institutions fulfil overall - economic, ecologic and social goals -
formulated in analytical forest-related programs. For this reason, we adopted the 3L Model
(see Krott and Stevanov 2008, Stevanov and Krott 2013, 2015 for details), which provides a
better understanding of the three Layer approach illustrated in the Figure 1. Other evaluations
look either for the direct link between vague policy goals (1\(^{\text{st}}\) Layer) and the empirical

\(^3\) A characteristic defect in rating scales when subjects get ranked either too high or too low on the basis of one
outstanding trait only (Spendolini 1992), e.g., the trap of a halo positive appears when an organization
establishes a reputation of doing something particularly well (e.g., making profit) and it is assumed that it
performs equally well in all other aspects, too.
measurements (3rd Layer), e.g., methodology of Forests Europe, or they focus on some particular aspects only. The 3L Model compensates for these shortcomings. It considers comprehensive goals relevant for policy-makers in guaranteeing sustainable forest management (1st Layer), anchors them into the palette of suitable and more specific theoretical concepts - economic, business management, natural and political science theories (2nd Layer), which enables design of theory-based evaluation criteria (Fig.1) that are comprehensive, simple and have potential for causative explanations (Krott and Stevanov 2008). Empirical feasibility of these evaluation criteria (3rd Layer) is secured by focusing on the empirical phenomena that are measurable with the help of quantitative and/or qualitative methods. Since concepts underlying each criterion are not intended to be fully operationalized (“rough” evaluation), observations on the 3rd Layer are made with the help of indicators (Fig. 1). Indicators are always selections based on some particular quality features (Meyer 2004; Stevanov 2014), such as validity, reliability, robustness, ease and wide applicability in our case (Stevanov and Krott 2013). In this paper two previously tested indicator sets were used for the evaluation; one for management and the other for authority tasks (Table 2). Their modifying or changing of which is always possible if it would better suit the reality of the particular case.

(FIGURE 1)

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4 E.g., economic evaluations are based on measurable quantitative aspects (Sekot 1998; Moehring and Leefken 2007), natural science theories as a base for selecting C&I to assess biodiversity (Dudley et al. 2005), etc.

5 Policy makers are interested in the policy relevant goals, so that the country’s policy programs become the most important formal standard for the criteria selection; policy makers are (also) interested in the options for policy change so that the applicable criterion needs to address factors which drive the activities of state forest administrations and influence their various outcomes/outputs (causative aspect); finally, policy makers are used to utilize rather simple and empirically sound arguments within their policy discourse so that criteria (and indicators) for judging success of state forest administrations need to be simple and empirically feasible at the same time, but still cover the main tasks of these administrations (Krott and Stevanov 2008).

6 Indicators act as signs/symptoms for the presence/absence of “something” without going into detailed analysis (Rametsteiner 2001; Stevanov and Krott 2013).
3 Methods

Our cases cover the former Yugoslavian republics of Serbia, Croatia, FYR Macedonia and Bosnia and Herzegovina – BiH (only the entity of the Republika Srpska)\(^7\) (Fig. 2). With the selected cases we aimed to cover the existing diversity with respect to the forest cover, forest ownership and legal forms of forest enterprises (Table 1), as well as EU membership\(^8\).

(Figure 2)

In the WB the public/state forest enterprises manage a considerable share of forest cover (Table 1) through their profound knowledge and field presence, being relevant market suppliers in situations where private forestry is not sufficiently developed (Glück et al. 2011), and having an obligation to guarantee sustainability standards and provide diverse services of general interests (CFL 2005; FLRS 2008; MFL 2009; SFL 2010). This is supported and controlled by ministry departments/sectors in charge of forestry, who conduct authority tasks regardless of ownership. Even though performance in both types of ownership is considered to be a result of owners/users activities and the influence of the steering authority (Stevanov and Krott 2013), the state-owned forest is evaluated here through activities/outputs of selected public/state forest enterprises, while judgment of an authorities performance focused only on the privately-owned forest.

(Table 1)

\(^7\) BiH constitutes two entities – Republika Srpska and the Federation of Bosnia and Herzegovina (plus the Brčko district). Federal organization of Bosnian Federation includes 10 cantons, each having its own cantonal government and organizations, so data collection was not feasible within the given project framework of a COST Action TN1401 CAPABAL. The same feasibility restriction holds for Albania and Montenegro.

\(^8\) Croatia became EU Member on the 1 July 2013, FYR Macedonia has been a candidate country since December 16th 2005 and Serbia from the March 1st 2012, while Bosnia and Herzegovina at the moment of writing this paper still has a status of a potential candidate.
The first research question, on the (formal) goals of public forest administrations, relied on qualitative content analysis (Schreier 2012) since this method allows to systematically reveal the meaning of the examined empirical evidence by focusing on particular aspects of interest (in this case, priority goals). At the same time, the method is flexible with respect to the type of evidence and allows the development of material-driven coding frame (ibid.). Our material consisted of (analytical) forest-related programs comprised of forest laws, strategies and other sources (Table 3). They contain public goals formulated by policy makers under the realm of sustainable forest management, which makes them the most important standards for judging state forest administrations’ performance (Stevanov, 2014). The coding frame, used to structure statements of relevance from analysed documents, was adopted from previous research (Krott and Stevanov 2008). It involved four groups of program goals as major categories (Table 2), which the consistency of was proven throughout the study. In each empirical case, the parts of analytical forest-related programs that contained statements of relevance were sequenced and assigned into respective categories; analysed in qualitative terms (without any particular software) and the findings were captured descriptively (text plus table summary). Afterwards, the findings were merged and jointly analysed. In order to reduce potential interpretive bias, all steps of critical enquiry were considered (Blanche et al. 2006) and the results jointly discussed among the team.

(TABLE 2)

To answer the second research question (fulfillment of program goals), administrations’ performance was evaluated against already designed criteria (C1 – C8) and indicators (Table 9. Neither relative weights of indicators, preferences of peers regarding indicator importance nor targeted indicator values, mutual interactions, linkages or relationships were considered, as is the case in other available procedures (e.g. Mendoza and Prabhu 2000, 2003a, 2003b; Wolfslehner et al. 2005, 2012; Jalilova et al. 2012).
As management tasks in selected WB cases are conducted by state/public enterprises (Table S1), we evaluated, using 20 respective indicators, the following enterprises: Srbijašume (Serbia), Hrvatske šume (Croatia), Šume Republike Srpske (Republika Srpska) and Makedonski šumi (FYR Macedonia) (Table 2). Empirical evidence needed for the measurement of these indicators comprised of documents (e.g., annual reports, profit and loss accounts, available forest management plans, enterprises’ newspapers), interview transcripts, as well as written questionnaires collected in addition to interviews. Document analysis and face-to-face interviews were used to measure criteria C1 to C6 whereas written questionnaires helped in measuring criteria C7 and C8.

Since authority tasks in selected WB cases are accomplished by directorates/sectors in charge of forestry (Table S1), we evaluated the Directorate for Forests in Belgrade (Serbian Ministry of Agriculture and Environment), the Directorate for Forests, Hunting and Wood Industry in Zagreb (Croatian Ministry of Agriculture), the Forestry Sector in Banja Luka (Ministry of Agriculture, Forestry and Water Management of Republika Srpska) and the Sector for Forestry and Hunting in Skopje (Macedonian Ministry of Agriculture, Forestry and Water Management) with the help of 17 indicators (Table 2). Empirical evidence was mainly based on judgments of experienced ministry representatives, who were asked to compare average situations in private versus state forests. For example, we asked them whether private forests have higher, same or lower coverage by forest management plans (C3). Such method of alternative-based judgments is well established in social sciences (Friedrichs 2006; Neuman 2006) and we applied it to criteria C1 to C6, whereas criteria C7 and C8 respondents were asked for direct judgments of the directorates/sectors political role (Table 2).

In total, 10 face-to-face interviews were held from June to September 2015 with respondents from state/public forest enterprises and ministry directorates/sectors in charge of
forestry (Table S2). Semi-structured face-to-face interviews\textsuperscript{10} were selected while combining a highly structured agenda with the flexibility to interact and ask subsequent questions (Babbie 2015). Conversations, held in native languages and transcribed right after the interview, preceded with the interview guideline, whose main structure relied on respective indicators (Table 2). Interviewees were selected based on their experience and good insight into administration’s performance. Prior to these detailed interviews we had unstructured and informal conversations with contact persons in respective administrations (gate keepers).

In total, 24 written questionnaires, comprising of five questions, were collected between June and September 2015 (Table S2) and used for judgment of public/state forest enterprises’ performance against criteria C7 and C8 (first two indicators). Additional, 27 short surveys were conducted between June and October 2015 to measure how administrations are perceived by other actors (within and outside the forestry sector) (Table S2). Survey administration (face-to-face, telephone or e-mail) was case-dependent (Table S2) and the snowball technique helped with the selection of interviewees.

All empirical evidence used for analysis was critically analysed (Browne and Keeley 2001), and subsequently applied logical, deductive and inductive reasoning, triangulation, and other tools commonly used in social science (Neuman 2006; Babbie 2015) helped judge manifestation of each indicator. These indicator manifestations were combined accordingly for every criterion, relying on explicitly defined interpretation procedures\textsuperscript{11} (Tables S3, S4 and S5), leading to performance judgments on the ordinal 0-3 scale (with the possibility of having institutions’ performance also laying “in between”, c.f. Babbie 2015).

\textsuperscript{10} Additionally to face-to-face interviews also three telephone interviews were needed for clarification purposes (e.g. with the HR department about contractors and their number) and collection of supplementary data, part of which was supplied via e-mail (Table S2).

\textsuperscript{11} Evaluation of forest directorates’/sectors’ proceeded with the help of a pre-defined matrix (Table S5). For example, for criterion C3 lower coverage by forest management plans in private forests, and lower biological investments in private forests give minus in a matrix combination, meaning weaker performance in private forests (Table S5). And while performance in state-owned forests was already measured around moderate (Table S3), authority performance was accordingly set lower than that (Table S5).
4 Results

4.1 Forest-related priority goals

The first priority goal captures numerous statements concerned with satisfying user needs on diverse forest goods and services (Table 3), such as wood and hunting, water or erosion protection, but also the preservation of biodiversity and climate change mitigation as some of the novel aspects. Regarding services such as recreation, citizens are nowadays free to access forests and use them for recreational purposes (CFL 2005; SFL 2010). In the novel WB legislation, forests are also under the scope of agricultural, traffic, water management or legislation of other sectors (Table 3) who require provision of very specific services such as protective belts (SLAL 2006; SLoPR 2005) or flood protection (SLW 2010).

The second priority goal, sustaining forest capacity for perpetual wood yield (Table 3), includes the narrow interpretation of sustainability as defined by foresters, i.e., the non-declining size and capacity of forests for perpetual wood production (Krott and Stevanov 2008). This goal is highlighted in all forest sector documents (Table 3) and operationalized mainly through forest laws, e.g., clear cuttings are banned (with exceptions), while forest management plans, prescribed annual cuts and tree marking are required. This sector’s core competence by no means excludes other forest uses. On the contrary, multi-functionality is preferred (CFL 2005; FLRS 2008; MFL 2009; SFL 2010), yet biodiversity and other ecological aspects belong under the previous (first) goal.

The third priority goal, strengthening economic performance of forestry, targets stronger contribution of the forest sector to the national economy, particularly emphasized in
forest strategies (Table 3). “Increased economic strength of forestry” is expected to contribute
to better social and economic development with efficient forest management and stronger
non-wood forest goods and services development (FDSRS 2011). Annual reports strongly
focus on profitability and efficiency (Table 3), whereas forest laws contain multiple indirect
statements, e.g., regarding priority conversion of all coppice forest into a productive forest

The fourth goal of inter/cross sectoral coordination (Table 3) targets harmonization and
cooperation between different forest-related sectors (e.g., forestry and forest-based industry,
agriculture, rural development, tourism, traffic, nature protection, etc.), which has become
relevant not only because forests are seen as an integral part of the overall natural resource
basis, but also since their potential for multiple uses is highly valued in times of increased and
diversified human needs. Whereas, for example, inter-sectoral coordination is strongly
emphasised in the EU Forest Strategy (EUFS 2013), in the WB it is an emerging issue only in
some national forest strategies (Table 3; CNFPS 2003; MFDS 2006). Some other forest-
related program elements (e.g., Law on Nature Protection) tackle it to a minor extent (Table
3).

4.2 Fulfilment of goals by public forest administration

4.2.1 Public/state forest enterprises

Orientation toward market demand (C1), covering activities focused on traditional
goods and services such as wood or hunting, has been evaluated as moderate for all
enterprises (Fig. 3, Table S3). This is due to their substantial market revenue (83% to 96% in
total revenue is generated mainly by selling the wood - fi-3; ARMŠ 2015; ARSŠ 2015;
ARŠRS 2015; ARHŠ 2015), and the low marketing competence (marketing decisions
predominantly rely on the experience and information collected randomly, more/less constant

https://mc06.manuscriptcentral.com/cjfr-pubs
annual harvests based on forest management plan information solely, etc. - fi-1-3; fi-5; FLRS 2008). This is accompanied by the narrow decision space (c.f. McDermott, 2009), meaning strong influence of politics on the top management, price lists of timber products controlled by the state, who often also dictates selling conditions. For example, Šume Republike Srpske are legally obliged to offer a certain amount of wood to domestic buyers first (FLRS 2008; fi-2).

**Orientation toward non-market demand** (C2), meaning demand (from outside of the enterprise) for specific environmental and/or recreational benefits such as biodiversity, soil/water protection or recreation trails, has been evaluated as weak for four analysed enterprises (Fig. 3, Table S3). It is due to the absence of substantial external financial inflow for the production/provision of these goods (fi-1-5). This (among others) led to the poor realization of plans in the field, even though the plans for production/provision of these public goods exist in all enterprises for the majority of the area where the primary function is protection (protective forests, protected areas) or recreation (ARSŠ 2014; FMAPŠRS 2014; fi-1-5). While the external money is typically scarce, the auditing in WB cases mostly consists of a formal control only (fi-1-5) being “camouflaged by silence” (Hubo and Krott 2013).

According to the criterion **Sustained forest stands** (C3), capturing foresters’ narrow interpretation of sustainability focusing on sustained wood yield, performance of Hrvatske šume has been between moderate and strong. Srbijašume and Šume Republike Srpske perform moderately, whereas Makedonski šumi performs between moderate and weak (Fig. 3, Table S3). Obligation to sustain forest stands existed in all four cases (ARHŠ 2015; ARSŠ 2014; ARMŠ 2015; ARŠRS 2015). Also substantial forest area (from 100% in Srbijašume and Hrvatske šume, 98% in Šume Republike Srpske to 95% in Makedonski šumi) was covered by (obligatory) forest management plans (fi-1-5). Triangulation of available sources showed that four enterprises did fulfil sustainability requirements in a greater area, despite
their slight differences. Access to some forest parts managed by Srbijašume, Makedonski šumi and Šume Republike Srpske (ARSŠ 2014; ARMŠ 2015; ARŠRS 2015) is restricted, mainly due to low average road density (≤10 km/000ha), therefore accessible forest area is prone to overuse. This is because the amount of wood allocated for cutting is calculated on the total forest area, while cutting is performed only in accessible areas. Restricted access may also hinder fire prevention, protection against insects or implementation of other biological measures. For instance in Croatia, biological measures conducted by Hrvatske šume are mainly financed from the green tax\(^\text{12}\) (ARHŠ 2015). This enterprise uses contractors to a much lower extent in comparison to other analysed enterprises (fi-2, fi-3 and 4, ti-12), who on the other hand report insufficient fulfilment of contracting requirements (ibid.). Illegal activities in forests are still reported in all examined WB cases (fi-2-5; ARSŠ 2014; ARŠRS, 2015; NŠ66 2014), and being declared by Makedonski šumi as significantly influencing its everyday operations (NŠ58 2012).

With regard to the Technical efficiency (C4), approximated by combining the technical productivity of work (annual harvesting amount per employee - 1000 m\(^3\)/person) and the managerial accounting (as an internal instrument in support of managerial decisions concerned with cost minimisation - Garrison et al. 2011), the performance for Hrvatske šume was set between moderate and strong, moderate for Srbijašume, between moderate and weak for Šume Republike Srpske, and weak for Makedonski šumi (Fig. 3). By that, the annual harvesting amount per employee (1000 m\(^3\)/person) was highest in Hrvatske šume (0.57), and lowest in Makedonski šumi (0.16), (Tables 1 and S3). Managerial accounting has been applied only in some organisational units of Srbijašume and Hrvatske šume (fi-3; ARMŠ 2014; NŠ 59-60, 65).

\(^{12}\) Green tax is collected from all registered firms. In Republika Srpska it is still in the initial phase, Serbian government terminated it and in FYR Macedonia it has never existed.
Based on the criterion *Profits from forests* (C5), measured as the annual surplus of total operating revenue over total operating costs before tax and per hectare, the enterprises’ performance proved strong for Hrvatske šume, weak for Šume Republike Srpske and Srbijašume, as well as zero for Makedonski šumi (Fig. 3, Table S3). While referring to the enterprises’ ordinary business (e.g. wood production, hunting, fishing), financial and/or extraordinary revenue/cost excluded, operating profit amounted to 16 Euro/ha for Hrvatske šume, 7 Euro/ha for Srbijašume and 5 Euro/ha for Šume Republike Srpske, whereas Makedonski šumi did not have a profit (Table 1). Since this is a relative comparison, the inclusion of additional enterprises would typically influence the ranking.

With regard to the *Orientation toward new forest goods* (C6), meaning either upgrade of existing or the introduction of new forest goods and services (marketing of which should generate revenue additional to traditional), we evaluated zero performance of Srbijašume, Makedonski šumi and Šume Republike Srpske and as weak performance in Hrvatske šume (Fig. 3, Table S3). This is because all enterprises have continued investing primarily into biological measures, infrastructure or vehicles. They did not make substantial investments into new forest goods and did not undertake market screening or other professional activities concerned with diversification of existing or consideration of new, non-traditional (forest) revenue possibilities (fi-1-3; fi-5). Only Hrvatske šume had some cooperation with cities and communities in pilot regions, with the aim of using forest biomass for innovative heating of public buildings, through new external partners via the EU project (fi-1).

Based on the criterion *Speaker for forestry* (C7), meaning a representative of the forest sector who supports multiple forest use but strongly advocates for sustainable wood yield in all occasions of public interest, the performance of all examined enterprises is evaluated as weak (Fig. 3). Questionnaires revealed that enterprises trustfully cooperated with mainly traditional, wood-based actors, e.g., ministry departments for forestry, forest faculty/institute,
wood buyers (q-1 to 7; q–16 to 19; q-27 to 33; q-40 to 43), which was the first indication of a speaker (Table S4). Even though all enterprises also aspired to this role of a forestry representative (fi-1-3; fi-5; q1; q4-7; q27-33; q40-42; q16-19) none of them was acknowledged as such by the majority of actors from outside the sector (ss-8 to 15; q-20-21; ss-22-26; ss-34 to 39; ss-44 to 47; ti-13).

Evaluated enterprises neither aspired toward the role of the Mediator between all interests in forests (C8), nor did they seem to be acknowledged as such (ss-8 to 12; ss–14 to 15; q-20-21; ss-22-26; ss-34 to 37; ss-39; ss–44 to 51). This resulted in zero performance in all four cases (Fig. 3, Table S4), which means there is an absence of unbiased mediators of a deliberative process who find solutions concerning multiple forest use and who aim to balance all interests in the protection and management of forests by relying solely on stakeholder demand.

(FIGURE 3)

4.2.2 Ministry directorates/sectors in charge of forestry

Privately-owned forests cover 11% of forest area in FYR Macedonia and up to 47% in Serbia (Table 1). Typically, the category of small private forest ownership dominates, and the preconditions for functioning of interest organizations are (still) poorly met (Avdibegović et al. 2010a; Glück et al. 2011) in most cases. Apart from either general or generalised information derived from already existing survey research (Halder et al. 2014; Posavec et al. 2015; Curman et al. 2016), more detailed secondary evidence is not available. There are no reliable statistics and even the number of private forest owners (PFOs) is roughly estimated, e.g., between 500 000 and 900 000 in Serbia (Petrović 2012). It is why we mainly used
statements of ministry representatives (chapter 3), who compared the average situation between private and state forests.

Forest departments/sectors in Belgrade (Serbia), Zagreb (Croatia), Skopje (FYR Macedonia) and Banja Luka (Republika Srpska) exhibited weak impact (Fig. 4) in terms of encouraging PFOs Orientation toward market demand (C1). According to forest law of all examined cases (CFL 2005; FLRS 2008; MFL 2009; SFL 2010), the PFOs were not allowed to cut unmarked trees or to transport wood from the forest without issued permission. However, even with restrictions, the freedom of harvesting was the same regardless of ownership (Table S5). This does not however hold for the quality of market information as the second indicator (Table S5). The interviewees (fi-6-10) suggested that in the case of active PFOs there was probably no big difference, but research indicates only up to 20% of all PFOs sell fuel wood and up to 16% sell industrial wood in the WB (Glück et al. 2011). Therefore, the great majority seem to not be active in the market. However, survey results (Halder et al. 2014; Posavec et al. 2015) show that PFOs would be willing to participate, especially in the supply of energy wood, but since many preconditions do not seem to have been fulfilled yet (Posavec et al. 2015; Curman et al. 2016), our respondents were confident that on average the state had better quality market information (fi-6-8; fi-10).

(FIGURE 4)

Based on the combination of indicator manifestations (resulting in the weaker performance in private forests - Table S5) and the already evaluated weak performance of state/public enterprises managing state forests (Fig. 3; Table S3), forest directorates/sectors in Belgrade, Zagreb, Skopje and Banja Luka were given a zero (Fig. 4) for their Orientation toward non-market demand (C2). Even the share of forests, legally classified in the WB either
as forests with a special purpose (i.e., forests in protected areas) or as protection forests (those
which primary purpose is protection of water, soil, protection against erosion, floods, etc.)
(CFL 2005; FLRS 2008; MFL 2009; SFL 2010), was much higher on the state-owned than on
the privately-owned land (fi-6 to 8; fi-10), budgetary means of four authorities are too weak to
cover the opportunity costs of PFOs if any protection regime is required on their land (ss-8; fi-
6 to 8; fi-10). Estimated compliance control (legally foreseen) was judged as not particularly
strong in general (fi-6; fi-7; ss-8) and the effective\textsuperscript{13} control in the field as (much) lower in
private than in state forests (fi-6; fi-7; fi-10).

Our results indicate more or less weak impact of forest authorities (Fig. 4) on PFOs

\textit{Sustained forest stands} (C3). Coverage of private forests by forest management plans was
rather low\textsuperscript{14}, even though in all examined cases these plans were obligatory also for private
ownership (CFL 2005; FLRS 2008; MFL 2009; SFL 2010). With respect to the so-called
biological investments (reforestation, tending or other activities that contribute to maintaining
the health, vitality and productivity of forest stands/soil sustained), in all WB cases we found
funding opportunities for private forests (e.g., green tax in Croatia and Republic of Srpska, the
fund for biological and simple reproduction in FYR Macedonia or annual calls of the Forestry
Directorate in Belgrade), yet the financial means given for those purposes were rather poor
and symbolic when compared to the relative amount of biological investments in the state-
owned forests (fi-6-8; fi-10; ss-44; ss-45). Taking these two indicator manifestations together
one can assume weaker performance in private than in state forests (Table S5). Since

\textsuperscript{13} Due to a variety of instances (forestry inspection/rangers control public/merit goods production within forest
management plans, nature protection inspection/rangers control plans required by environmental legislation) and
approaches (e.g. field control, document approval, etc.), but also due to the fact that job description (e.g. rangers)
does not include only control, it was not feasible to estimate the number of people (in FTE equivalents)
responsible for control in private vs. state forests (in producing/providing public/merit goods). But effective
control was, on the other hand, judged much lower in private than in state forests.

\textsuperscript{14} Due to the complex requirements (plans for private forests are required to have the same standards as for state
forests), but also scarce budgetary means, property fragmentation, often unclear ownership and other factors
(Avdibegović et al. 2015; Krajter Ostoić et al. 2015; Nonić et al. 2015; Stojanovski et al. 2015), even simplified
plans do not always get generated and privately-owned forests are poorly covered by management plans.
performance of public/state enterprises Hrvatske šume, Srbijašume and Šume Republike Srpske state forests were evaluated between strong and moderate (Fig. 3; Table S3) therefore we accordingly set performance of the forest authority in Serbian, Croatian and Republika Srpska between moderate and weak (Table S5). Performance of the Macedonian authority was assessed as weak, as Makedonski šumi’s performance was between moderate and weak (Table S3; Fig. 3).

Against the criterion **Technical efficiency** (C4), forest authorities in Belgrade, Zagreb, Skopje and Banja Luka exhibited zero performance (Fig. 4, Table S5), which means there was no indicated impact on the technical efficient production of PFOs. Ministry representatives unanimously agreed (fi-6-8; fi-10) that technical productivity could potentially be higher in private enterprises rather than in state enterprises, especially on larger parcels, but those are not many (ss-8; ss-34; ss-39). The average private forest would accordingly exercise lower (technical) productivity of work (fi-6; ss-36). The lower accessibility of private forests (fi-6-8; fi-10), as the second indicator manifestation (Table S5), is understandable when knowing that in Socialist Yugoslavia investments in forest infrastructure have been done in state-owned forests and that later transition weakened state budgets, whereas at the same time the majority of PFOs remained unorganized (Nonić 2004; Avdibegović et al. 2010b; Županić 2011). Even though PFOs motivation to cooperate with each other on forest road construction and maintenance is high (Glück et al. 2010a, 2011), the examples of joint actions are rare (fi-6-8; fi-10). By combining these indicator manifestations (Table S5) performance in private forests proved weaker than in state forests (Fig.3, Table S3).

Indicated impact of forest authorities with regard to the **Profits from forests** (C5) was in all four cases evaluated as zero (Fig. 4, Table S5). As estimated by our experts from Belgrade, Zagreb and Banja Luka (fi-6; fi-10; ss-36), profitable forest management in private forests of examined WB cases had rather been an exception than the rule. A ministry representative
from Skopje evaluated the average situation as being equal in both state and private forests (fi-8), ultimately meaning not profitable in Macedonia. With this in mind, a typical private forest property in all examined cases is a small-scale estate, fragmented and with multiple owners; it is clear that the economies of scale can hardly be achieved (Glück et al. 2011; Posavec et al. 2015). The consolidation of ownership and cooperation among PFOs is therefore necessary, but remains an unachieved precondition for sustainable and profitable forest management (Glück et al. 2011; Avdibegović et al. 2015; Krajter Ostoić et al. 2015; Nonić et al. 2015; Posavec et al. 2015; Stojanovski et al. 2015). PFOs also use their forests to satisfy family needs, typically for energy wood and occasionally timber sales (Glück et al. 2011; CNVP 2013; Curman et al. 2016).

After comparing the final combination of indicator manifestations (Table S5) with the (weak/zero) results of the state-owned forests (Fig. 3, Table S3), the indicated impact of the four authorities with regard to PFOs Orientation toward new forest goods (C6) was estimated as zero (Fig. 4). Development of new forest goods, as those that are not traditionally produced by PFOs, requires investments (Klemperer 2003). However, in all examined cases, experts from the ministry departments/sectors were not aware of the existence of such investments in private forests (fi-6 to 8; fi-10). Even if there were any exceptions, the extent of the investments would probably be less in private than in state forests (ibid.). Due to the absence of investments and entrepreneurship, no revenues were generated by the marketing of new private goods either (fi-6 to 8; fi-10).

Each ministry department/sector from Belgrade, Zagreb and Banja Luka has been judged as a weak Speaker for forestry (C7). Skopje performance was estimated as zero due to the absence of aspiration towards a speaker role (Fig. 4). Respondents from four forestry directorates/sectors (fi-6-8; fi-10) predominantly indicated wood-based actors as trustful partners of their institutions, which was the first indication of a potential speaker (Table S4).
The respondents from Serbia, Croatia and Republika Srpska also claimed that their institutions already act as speakers (fi-6-7; fi-10). Other actors did not however share that view. Only a representative of the Macedonian ministry was certain that this institution had no aspiration toward a speaker role (fi-8). This view was confirmed by the majority of the other actors in WB (ss-44-47; ss-51).

There was no Mediator of all interests in forests (C8) among examined cases (Fig. 4; Table S4). Although our survey showed that forest directorates/sectors cooperated most trustfully with traditional, wood-based actors, and that most of them aspired towards a speaker role (see previous criterion), our respondents from Serbia, Croatia and Republika Srpska (fi-6-7; fi-10) were certain that their institutions also strived towards the role of a mediator. Such perception might as well be related to their perception of the goal of multipurpose forestry. Yet the four directorate/sectors proved not to be acknowledged as mediators by the majority of actors from outside of the forest sector (ss-9-15; ss-34-39; ss-44-51; q-20-21), which indicates zero performance (Table S4).

5 Discussion

Based on empirical evidence from selected WB countries we can answer our two research questions, i) what (formal) goals lead public forest administrations and ii) how public forest administrations fulfil these goals in the forest. In addition, we will recommend strategies for a new and improved role of public forest administration (chapter 5.1).

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15 Serbia: Institute of Lowland Forestry; public enterprises managing national parks; the Environmental Department of the Ministry of Agriculture and Environment, the Water Management Company; wood processing firm; Chamber of Commerce (Table S2). Croatia: deputy minister of the Ministry of Environment and Nature Protection; Association BIOM; Nature Park Medvednica; Croatian Forest Research Institute (private forests); the Inspectorate of the Ministry of Environment and Nature Protection; the Ministry of Agriculture. Macedonia: National Association of Private Forest Owners; Connecting Natural Values and People Foundation; Public Enterprise "Parks and Greenery"; Ministry of Agriculture, Water Management and Forestry; Faculty of Forestry, University of Skopje; Environmental Ministry. Republic of Srpska: Private Forest Owner Association; private forest company (conducting forest harvesting, skidding and transportation works); Environmental Ministry; Faculty of Forestry, University of Banja Luka.
1) **Multifunctional and economically strong forestry**: in all WB cases, forest-related (analytical) programs are comprised of strong elements and set the goals of multifunctional and economically strong forestry. Three priority goals satisfying user needs on forest goods and services, sustaining forest capacity for perpetual wood yield, and strengthening economic performance of forestry are anchored in the strongest political forest law and are well in line with the international programs (Sarvašová et al. 2013b; Pülzl et al. 2013, 2014) and concepts of multifunctional forestry found in literature (Wiersum and Elands 2002; Schmithüsen 2007; Borras et al. 2016). The fourth priority goal of inter/cross sectoral coordination has received growing international recognition (Glück et al. 2010b). However, it is only stated in forest strategies, which are politically weaker than forest laws. This signals that coordination among forest-related sectors has had no legal support so far. Inter/cross sectoral coordination therefore remains a challenge for the WB forestry in the future.

2) **Sustained forests and strong economic performance as implementation priorities in state forests**: in state forests, the implementation of policy goals shows prioritisation towards sustained forest stands (e.g., non-declining forest area, standing volume, etc.) and good economic performance (profitable and efficient production) oriented toward markets, whereas satisfying users’ needs outside the market was neglected. However, these priorities do not mean that the goals are fully met:

- Even achievements of most of the examined enterprises in sustaining forest stands are close to the target, only Makedonski šumi (FYR Macedonia) almost failed with meeting this goal.

- Although four enterprises are strongly oriented toward wood demand, their performance has been moderate so far. Technical efficiency proves to be an important issue in the WB, but the relative comparison of enterprises showed that
two (out of four) did rather good, one of which by far achieved the highest profit (Hrvatske šume).

3) **Weak success of forest authorities in providing support for sustained forest stands and market orientation in private forests**: in all cases the priority of ministry directorates/sectors in charge of forestry, as authority institutions, is supporting sustained forest stands, only a weak success has been observed in private forests so far. This is in line with the findings of Glück et al. 2010a, and might be related to small-scaled, highly fragmented private forests, among others. However, a recent research survey revealed that production-oriented private forest owners “(...) appear to be conscious of the fact that their actions on their forestland can affect the sustainability and they appear to value that responsibility” (Avdibegović et al. 2010a, p. 259). Supporting PFOs orientation toward market demand (wood-based products in the first place) is another important goal that proves to be achievable in WB private forests, but to a lesser extent than in state forests.

4) **The weak political role of public forest administration**: in all four cases most of the examined administrations (enterprises and ministry departments/sectors) aspire to the role of a speaker for forestry, but none of them is sufficiently recognized as such by other actors. This result clearly indicates that forest sectors in the WB are currently politically weak due to the absence of competent and recognized representatives. Alternative political roles (i.e., a mediator) are neutral and facilitate all different interests concerned with the use and/or protection of forests. Yet, this is even less realized by public forest administrations in WB, since enterprises do not take this option into account because ministry departments/sectors are weak. This signalizes the absence of a forest actor who could act in support of a balanced, multipurpose forestry, in spite of the fact that this goal is becoming ever more important and strongly advocated on national and international levels (Verbij, 2004; Pülzl et al. 2013; Sarvašová et al. 2013b; Pülzl et al. 2014).
5.1 Implications for the new role of public forest administrations in the future- Our evaluation pointed out multiple possibilities for political action:

1) **Guarantying sustained forest stands is a permanent policy challenge that can be addressed by perpetually reinventing forest policies:** despite being at the core of the forest policy for more than a century, the goal of sustaining forest stands seems not to have been realized over the whole forest area of the examined cases. Whereas in state-owned forests, some challenges have still been identified, the forest authorities are facing even bigger challenges to fulfil this goal in privately owned forests. These results clearly signalize the traditional focus of forest policy on sustaining forest stands still prevails. The success of WB countries in coping with this challenge should therefore not be underestimated, but there is still plenty of space for improvement in practice, by permanently reinventing a country’s forest policies.

2) **Stronger supply of marketable and non-marketable goods and services:** our results showed that orientation could be stronger toward both marketable and non-marketable forest goods and services. This finding is in line with several studies claiming that WB forests could be more productive in timber, while their contribution to climate change, biodiversity and infrastructure protection would grow as well (Ćosić et al. 2011; MoESPP December 2012; Tijardović et al. 2013; World Bank 2016). However, increasing one does not necessarily have to be at the expense of the other (Ruiz-Benito 2014). Innovative technical solutions and forest policy instruments could help. For example, areas primarily used for timber production and those dedicated to biodiversity and other protection purposes could be spatially optimized or innovative silvicultural techniques could be used to combine timber with non-market production within the same stand (Carnus 2006). Since this may lead to conflicts (between different forest users and/or uses), novel policy is required. Therefore, stronger orientation
toward marketable and non-marketable goods and services would require both innovative technical solutions and overcoming challenges of implementing forest policy instruments in the field (Brukas et al. 2012). Consequently this increases the need for an efficient and strong forest authority (Burns et al. 2017).

3) Interplay of internal and external pressures could drive efficiency and profitability efforts of forest enterprises: efficiency and profits are important for public/state forest enterprises, but at the same time our (relative) comparison showed diversified success. The Croatian enterprise performs somewhat better, yet there is some space for the others to meet these goals better in the future, too. The pressure for improved efficiency will grow as soon as the region’s current advantage of low salaries is lost. Besides, the willingness of already weak state budgets to provide financial aid would probably continue to shrink in the future and that might pose additional (financial) pressure on the enterprises to improve internal practices. However, without some progress in technical efficiency, profit can hardly grow either (Klemperer 2003).

4) Pushing innovation forward could strengthen the economic performance of forest enterprises: by looking for innovation practices our evaluation could not evidence any significant activities, which is quite the opposite to some other transitioning countries (Šalka et al. 2006). State/public forest enterprises do not push innovation forward, despite their moderate economic performance. Even the most basic innovation factors are absent, such as entering new partnerships (Innes 2009; Weiss et al. 2012) or investing into risky projects (Rometsteiner and Weiss 2006). If this practice would change, that could strengthen the economic role of forest enterprises (Weiss et al. 2011), which would be especially relevant if those would become obliged to transfer (part of) their profits directly to the state budget in the future.
5) **Influencing forest policy by joining forces**: however, even though all examined administrations want to play an active role of a speaker for forestry, and become recognized as such, none of these self-proclaimed speakers has achieved that so far. Current pluralistic networks do involve actors with required competences, but there are no sectors internal procedures that would be focused on one specific actor only. This well-known political weakness of the forest sector, resulting in ineffective lobbying and/or advocating (Baur 2002; Sarvašová et al. 2013a), holds true in the WB countries as well. To be acknowledged as a speaker for forestry, the public forest administration would accordingly need to enter a coalition with a powerful actor (Krott 2005). The absence of strong PFO associations and their representatives (Glück et al. 2010a; Avdibegović et al. 2011, 2015; Krajter Ostoić et al. 2015; Nonić et al. 2015; Stojanovski et al. 2015) negatively affect corporatism. An innovative option for public forest administrations might accordingly be to enter coalitions with the wood industry. Examples of such public-private partnerships already exist and one of them (Krott 2008a, 2016) is driving forest policy in Germany (Thuringia).

6. **Conclusions**

Our paper focused on public forest administrations and their implementation of public goals as evaluated by social sciences. The approach was neither related to discourse analysis nor was it a profound economic or ecologic study. We applied comprehensive C&I approach resulting from the 3L Model, which is different from partial (e.g. economic) or other comprehensive approaches (e.g. Forests Europe). The evaluations based on a 3L Model used eight theory-based criteria, which helped judge complex tasks of public forest administrations simpler. Besides, a theoretical basis of evaluation criteria opened the possibility for causative analysis. For example, the deficits in efficiency need to be analysed by economic theory,
whereas a speaker’s weakness is a political problem for which a solution should be sought in a political theory. This is an important avenue for future research.

The use of indicators made our evaluation empirically less than perfect, but still sufficiently evidence-based, since they do not go deeper than signalizing possible trends. All indicators, applied on the Empirical Layer, proved to be fully applicable. A strength of the C&I approach lies in its adaptability. For instance, indicators could be adapted or changed when faced with data limitations, country-specific conditions, or similar factors. In the case of indicators (e.g., profits of state/public forest enterprises), where relative comparison is required, the inclusion of institutions with much higher profits would improve the existing rating. Altogether the 3L Model offered a good basis for a comprehensive comparison of often competitive public goals.

Comprehensive C&I evaluation revealed performance deficits, but also plenty of options to strengthen public forest administrations in the WB toward active and stronger roles in forest policy. That could contribute meeting public, forest-related goals better in the future. Moreover, comparison of the overall performance of state forest administrations from four WB cases proved remarkably similar. Whereas dominant state forests, with their respective managing enterprises, perform much better than private forests, forest authorities’ control and support have failed to solve huge problems related to private forests so far. As this is regardless of natural (forest cover, ownership) or legal status and also regardless of EU accession status, one could assume that transition to EU membership (in preparation and achievement) has not made a big difference in forestry practice on the ground. The common traditions of four WB cases seem to have dominated EU reforming efforts up to now, which was observed in some other contexts as well (Noutcheva 2009; Freyburg and Richter 2010). This is another avenue for upcoming research. With more countries included, the current
approach has the potential to unearth many further insights within the complex issue of public forest administrations in the future.

Acknowledgements

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Tables

Table 1. Country profiles and the selected data on public/state forest enterprises

<table>
<thead>
<tr>
<th>Country profile</th>
<th>Serbia</th>
<th>Croatia</th>
<th>FYR Republic of Macedonia</th>
<th>Republika Srpska (BiH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Total area (km²)</td>
<td>29 913</td>
<td>56 594</td>
<td>25 713</td>
<td>24 641</td>
</tr>
<tr>
<td>• Inhabitants (mio)</td>
<td>7.2</td>
<td>4.4</td>
<td>2.05</td>
<td>1.4</td>
</tr>
<tr>
<td>• Total forest area (000 ha)</td>
<td>2 252</td>
<td>2 581</td>
<td>1 159</td>
<td>1 282</td>
</tr>
<tr>
<td>• Forest in the total land area (%)</td>
<td>29.1</td>
<td>45.6</td>
<td>36</td>
<td>51.7</td>
</tr>
<tr>
<td>• Forest per inhabitant (ha)</td>
<td>0.3</td>
<td>0.6</td>
<td>0.4</td>
<td>0.8</td>
</tr>
<tr>
<td>• State forest ownership (000 ha)</td>
<td>1 194 (53%)</td>
<td>1 988 (77%)</td>
<td>1 031 (89%)</td>
<td>1 000 (78%)</td>
</tr>
<tr>
<td>• Private for. ownership (000 ha)</td>
<td>1 058 (47%)</td>
<td>593 (23%)</td>
<td>128 (11%)</td>
<td>282 (22%)</td>
</tr>
</tbody>
</table>

Enterprises managing state-owned forests

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal status</td>
<td>Public enterprise</td>
<td>State enterprise</td>
<td>Public enterprise</td>
<td>Public limited company</td>
</tr>
<tr>
<td>Annual wood harvesting (000 m³)</td>
<td>1 328</td>
<td>5 144</td>
<td>451</td>
<td>2 047</td>
</tr>
<tr>
<td>Total number of employees (FTE)</td>
<td>own</td>
<td>contractors</td>
<td>total</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 073</td>
<td>1 200</td>
<td>4 273</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 079</td>
<td>1 800</td>
<td>8 879</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2134</td>
<td>600</td>
<td>2 734</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 300</td>
<td>6 264</td>
<td></td>
</tr>
<tr>
<td>Harvetsed wood per employee (000 m³/person)</td>
<td>0.31</td>
<td>0.57</td>
<td>0.16</td>
<td>0.33</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Forest area (ha)</td>
<td>767 203</td>
<td>1 831 337</td>
<td>835 055</td>
<td>738 590</td>
</tr>
<tr>
<td>Total area (ha)</td>
<td>893 416</td>
<td>1 987 799</td>
<td>1 091 857</td>
<td>998 206</td>
</tr>
<tr>
<td>FTE / 1000 ha of forest area</td>
<td>5.5</td>
<td>4.8</td>
<td>3.2</td>
<td>8.4</td>
</tr>
<tr>
<td>Forest certification</td>
<td>Yes (FSC)</td>
<td>Yes (FSC)</td>
<td>No</td>
<td>Yes (FSC)</td>
</tr>
<tr>
<td>Operating profit * (000 EUR)**</td>
<td>5 415</td>
<td>27 618</td>
<td>loss</td>
<td>4 081</td>
</tr>
<tr>
<td>Operating profit per ha of forest (EUR/ha)</td>
<td>7</td>
<td>16</td>
<td>loss</td>
<td>5</td>
</tr>
</tbody>
</table>

**Legend and notes:** *central Serbia and Vojvodina; est.- established; m – FTE - Full Time Equivalents (contractor estimations); n - surplus of primary operations (e.g. wood harvesting and selling, etc.), financial and other/extraordinary profit excluded, for Makedonski šumi for the year 2013; o - conversion from national currency to Euro (EUR) according to the official exchange rate of the national banks on 31st December 2016; sources: ARHŠ (2017); ARŠŠ (2017); ARŠRS (2017); ARMS (2014); DZS (2016); Čavlović (2010); FDSRS (2011); fi-3; fi-4; RZS (2016), SORM (2016); etc. (diverse sources).**

**Table 2: Criteria and indicators used to measure implementation of program goals**

<table>
<thead>
<tr>
<th>Goals</th>
<th>Criteria (C)</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Management tasks (20 indicators)</td>
</tr>
<tr>
<td>Satisfying users needs on forest goods and services</td>
<td>C1</td>
<td>Orientation toward market demand</td>
</tr>
<tr>
<td>C2</td>
<td>Orientation toward non-market demand</td>
<td>Plans for production/provision of public/merit goods, financial inflow for public/merit good production, auditing</td>
</tr>
<tr>
<td>Sustaining forest capacity for perpetual wood yield</td>
<td>C3</td>
<td>Sustained forest stands</td>
</tr>
<tr>
<td>Strengthening economic performance of</td>
<td>C4</td>
<td>Technical efficiency</td>
</tr>
</tbody>
</table>

45
<table>
<thead>
<tr>
<th>forestry</th>
<th>C5 Profits from forests</th>
<th>Annual surplus of total operating revenue over total operating costs, before tax (relative, Euro/ha)</th>
<th>Profitability (private vs. state forests)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C6 Orientation toward new forest goods</td>
<td>Professional market information, investments into new forest goods, new external partners</td>
<td>Investments into new forest goods, revenue from new forest goods</td>
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<td>Inter/cross sectoral coordination</td>
<td>C7 Speaker for forestry</td>
<td>Trustful cooperation with wood-based actors, aspiration of speaker’s role, acceptance of speaker’s role by other actors</td>
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<tr>
<td>C8 Mediator of all interests in forests</td>
<td>Trustful cooperation with actors from many different sectors, aspiration of mediator’s role, acceptance of mediator’s role by other actors</td>
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Note: based on Stevanov and Krott 2013.

### Table 3. Emphasis of priority goals in analytical forest-related programs of WB cases

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<td>Strengthening economic performance of forestry</td>
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Croatia

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FYR Macedonia

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Republika Srpska (BiH)

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https://mc06.manuscriptcentral.com/cjfr-pubs
Differences between strong/moderate/weak emphasis emerged as a result of a qualitative content analysis (chapter 3), taking into account not the very amount or frequency of statements but more their quality features (e.g. it made a difference if statements were formulated in the first several paragraphs of the forest law or somewhere later; the very sense was analysed and not the key-words; etc.)

**Figure captions**

**Fig.1. 3L Model:** The 1\(^{st}\) Program Layer (with priority goals of analytical forest-related programs) is coupled with the 2\(^{nd}\) Theory Layer (containing theoretical frameworks), so that theory-based evaluation criteria C1 – C8 emerged, which are observed on the 3\(^{rd}\) Empirical Layer (with the help of indicators)

**Source:** based on Krott and Stevanov 2008; Stevanov and Krott 2013; Stevanov 2014; Stevanov and Krott 2015; Chudy et al., 2016

**Fig.2. Analysed cases (coloured)**

**Fig.3.** The performance of public/state forest enterprises in Serbia, Croatia, FYR Macedonia and Republika Srpska (BiH)

**Legend:** 3 (strong), 2 (moderate), 1 (weak) and 0 (zero) performance

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Legend: (+++) strongly emphasized; (++) moderately emphasized; (+) weakly emphasized; ( / ) not mentioned.
Fig. 4. The performance of ministry directorates/sectors in charge of forestry in Serbia, Croatia, FYR Macedonia and Republika Srpska (BiH)

Legend: 3 (strong), 2 (moderate), 1 (weak) and 0 (zero) performance
Fig. 1. 3L Model: The 1st Program Layer (with priority goals of analytical forest-related programs) is coupled with the 2nd Theory Layer (containing theoretical frameworks), so that theory-based evaluation criteria C1 – C8 emerge, which are observed on the 3rd Empirical Layer (with the help of indicators).

Source: based on Krott and Stevanov 2008; Stevanov and Krott 2013; Stevanov 2014; Stevanov and Krott 2015; Chudy et al., 2016
Fig. 2. Analyzed cases (coloured)

281x251mm (96 x 96 DPI)
orientation toward non-market demand

orientation toward market demand

orientation toward new forest goods

technical efficiency

sustained forest stands

mediator of all interests in forests

speaker for forestry

profits from forests

Srbijašume (Serbia)

Hrvatske šume (Croatia)

Šume Republike Srpske (BiH)

Makedonski šumi (FYR Macedonia)
The diagram illustrates the orientations of different forest management entities towards market demand, technical efficiency, and sustained forest stands. Each entity is represented by a different color:

- Blue: Directorate of forests in Belgrade (Serbia)
- Red: Directorate of forests, hunting and wood industry in Zagreb (Croatia)
- Green: Forestry sector in Banja Luka (BiH - Republic of Srpska)
- Purple: Forestry and hunting sector in Skopje (FYR Macedonia)

The orientation toward non-market demand, profits from forests, and orientation toward new forest goods are also indicated on the axes.