



**FORS<sup>2</sup>D**

FORESTRY SCIENCE FOR SUSTAINABLE DEVELOPMENT

# BOOK OF ABSTRACTS

**"Perspectives of forestry and related sectors  
as drivers of sustainable development in the post-Covid era"**

**Banja Luka, the Republic of Srpska / Bosnia and Herzegovina  
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# FORS<sup>2</sup>D

FORESTRY SCIENCE FOR SUSTAINABLE DEVELOPMENT

## "Perspectives of forestry and related sectors as drivers of sustainable development in the post-Covid era"

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## Foreword

Dear participants and friends,

The International Scientific Conference "**Forestry science for sustainable development FORS<sup>2</sup>D – Perspectives of forestry and related sectors as drivers of sustainable development in the post-Covid era – FORS<sup>2</sup>D**" in Banja Luka is held on the occasion of important Jubilee (30 years) of the Faculty of Forestry, University of Banja Luka, and 30 years of PFE "Šume Republike Srpske" a.d. Sokolac, in cooperation with FAO (*United Nations Food and Agriculture Organization*). Considering global changes that we are facing, the importance of forests cannot be underestimated. We depend on forests for our survival, from the air we breathe to the wood we use, but without education and scientific research we cannot promise sustainable development or sustainable forestry. Besides basic functions of forests needed for humans, forests also offer climate change mitigation, watershed protection, prevent soil erosion and torrential floods that we are frequently facing in recent decades. Unfortunately, despite our dependence on forests, we are still allowing them to disappear.

This Conference will give an opportunity for participants to address important issues related to forestry, exchange recent research, knowledge and experiences in forestry and related fields, to establish functional international cooperation among institutions, to improve cooperation between forestry science and practice and finally to forestry as important sector for human well-being at local, national and global level.

The Conference is organized in nine sessions along different themes. Together there are five plenary lectures, 64 oral presentations and 64 poster contributions, with more than 120 participants.

As announced, authors, the reviewed and accepted papers are going to be published in the Bulletin of the Faculty of Forestry, University of Banja Luka (<http://glasnik.sf.unibl.org>).

We wish you a very successful Conference and pleasant stay in Banja Luka.

*Chair of the Organization Committee*  
*Marijana Kapovic Solomun*

## **Predgovor**

Dragi učesnici i prijatelji,

Međunarodna naučna konferencija „Šumarska nauka za održivi razvoj FORS<sup>2</sup>D – Perspektive šumarstva i povezanih sektora kao pokretača održivog razvoja u post-kovid eri – FORS<sup>2</sup>D” se održava u Banjoj Luci povodom značajnog jubileja (30 godina) Šumarskog fakulteta Univerziteta u Banjoj Luci i 30 godina JPŠ “Šume Republike Srpske” a.d. Sokolac, u saradnji sa FAO (Organizacija Ujedinjenih nacija za hranu i poljoprivredu). Imajući u vidu globalne promjene kojima se suočavamo, značaj šuma mora biti posebno istaknut. Opstanak čovječanstva zavisi od šuma od vazduha koji udišemo do drveta koje koristimo kao materijal, ali bez obrazovanja i naučnog istraživanja ne možemo obećati održivi razvoj ili održivo šumarstvo. Pored osnovnih funkcija šuma potrebnih čoveku, šume takođe nude ublažavanje klimatskih promjena, zaštitu riječnih slivova, sprječavanje erozije zemljišta i bujičnih poplava sa kojima se često suočavamo poslednjih decenija. Nažalost, uprkos činjenici da zavisimo od šumskih ekosistema, mi i dalje dozvoljavamo da one nestaju.

Ova Konferencija će pružiti priliku učesnicima da se pozabave važnim pitanjima vezano za šumarstvo, razmijene novija istraživanja, znanja i iskustva u šumarstvu i srodnim oblastima, da uspostave funkcionalnu međunarodnu saradnju među institucijama, da unaprijede saradnju šumarske nauke i struke i konačno da istaknu šumarstvo kao važan sektor za ljudsko blagostanje na lokalnom, nacionalnom i globalnom nivou.

Konferencija je organizovana u devet sesija na različite teme. Učesnicima će se obratiti pet eminentnih plenarnih predavača, 64 usmenih izlaganja i 64 poster priloga, sa više preko 120 učesnika. Kako je najavljeno, recenzirani i prihvaćeni radovi biće objavljeni u Glasniku Šumarskog fakulteta Univerziteta u Banjoj Luci (<http://glasnik.sf.unibl.org>).

Želimo Vam uspješnu Konferenciju i ugodan boravak u Banja Luci.

*Predsjednica Organizacionog odbora*

*Marijana Kapović Solomun*

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1. Forest and sustainable development in light of climate change
2. Nature-based solutions
3. Let's green, be seen
4. A modern and competitive forestry sector
5. Innovative value chains and sociological aspects in forestry and related sectors

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## TRANSVERSE STRESS WAVE VELOCITY IN NORTHERN RED OAK TREE: ASSESSMENT OF THE WOOD QUALITY

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### ABSTRACT

In this paper, the transverse wave velocity was investigated, as well as the possibility of assessing the quality of wood in northern red oak trees using the velocities of transverse stress waves. Stress wave velocity was recorded using a 2D acoustic tomograph with appropriate sensors and equipment. The recordings were made on a total of 18 sections on 9 trees from three northern red oak sites in Serbia. Based on the obtained results, it was concluded that the orientation of the annual ring in regard to the direction of sound propagation affects its speed. It was determined that the average stress wave velocity at the cross-sections is 1660 (1159-2350) m/s. However, it is higher in the tangential direction compared to the radial one. The relative difference between the reference and the measured speed was used to assess the quality of the wood. This relative difference indicates the amount of decay between the two sensors. The largest number of cross-sections had a speed loss of up to 10%, but there were also cross-sections with a speed loss of more than 30% in the radial direction. This result shows us that there are defects and damages in this direction that will reduce the strength of the wood, and thus narrow the field of use of wood from this part of the tree.

**Key words:** red oak, acoustic tomography, stress wave, assessment, transverse section