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Eastern Hub Roadmap for Targeted Transfer of Best Practices and Innovations

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1 ROADMAPS ON HUB LEVEL

1.1 INTERREGIONAL ROADMAP FOR THE EASTERN HUB

1.1.1 DESCRIPTION OF THE HUB REGION

The East Europe Hub is one of four ROSEWOOD - Wood Mobilisation Regional Hubs which covers the area of Romania, Slovenia, Croatia. Beyond the project partners, the Eastern Hub has extended its ROSEWOOD network with experts from Hungary, Bosnia and Herzegovina, Serbia, North Macedonia, Montenegro, Greece, Bulgaria and Slovakia. Project partners of the Eastern Hub are the Competence Centre Ltd. for Research and Development, the Croatian Forest Research Institute, the Slovenian Forestry Institute and KO-FA Association - Cluster ProWood Romania. **Figure 1** shows the project partners per country and gives some key characteristics of the partnering countries and regions.

The Eastern Hub region has a high wood mobilisation potential represented by the high forest share in total land territory (over 40 %) and a high percentage of natural forests (95 %). Furthermore, the region is geographically positioned on the border of Euro Siberia – North America and Mediterranean regions and consequently enriched with high diversity of forest communities (over 100). The availability of natural resources is a result of a more than 150 years long tradition in silviculture. The basic principle of the sustainable forestry management – preservation of the natural structure and biodiversity of forests - led to the continuous rise of the stability and quality of economic, social and environmental functions of the forest.

Even though the Eastern Hubs countries share numerous common characteristics, diversities exist between the wood and forestry sectors on national levels. One of the basic diversities are forest ownership structures shown in **Figure 2**. In Croatia, three quarters of forests are publicly owned (state-owned), while only one quarter are privately owned properties. The situation in Slovenia is exactly the opposite: 74% of forests in Slovenia are private property, while 26% of forests are public. In Romania, the structure is different. Around half of the forests are state owned, complemented by a third owned privately and 17 % owned by municipalities. Consequently, one of the joint obstacles in the Hub region is the fragmentation of forest property. This situation makes professional work in private forests very difficult, limiting the region in its potential for an optimal timber production and utilisation of forest potential. The mentioned obstacle refers to overall professional management of forests as well, meaning that larger and undivided forest estates of state-owned forests enable good professional management, whereas smaller forest properties do not.



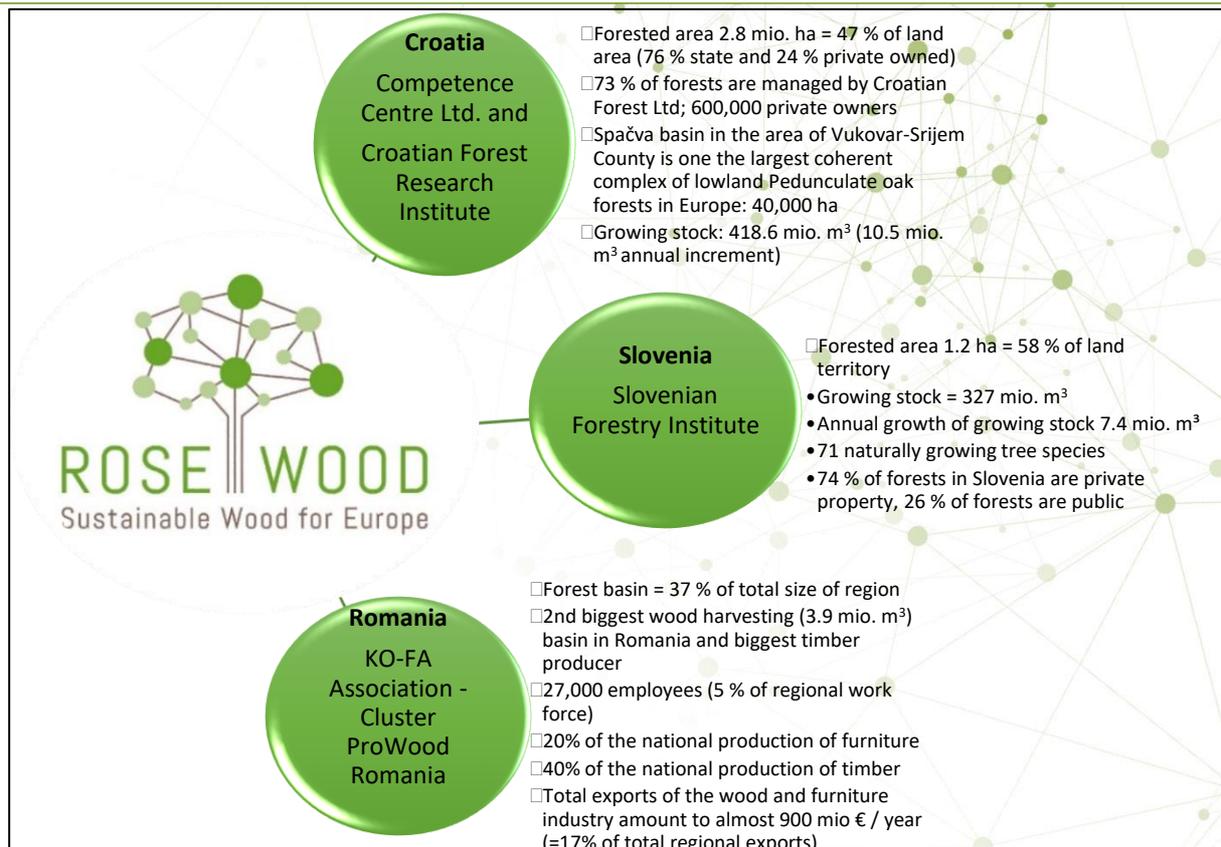


Figure 1: East Europe Hub partners and characteristics of East Europe Hub countries / regions

The wood-based industries in Croatia, Slovenia and Romania have an important role in overall economies. They consist of a large number of small and medium-sized enterprises (SMEs) that face difficulties in reaching a good market position and becoming competitive. Nevertheless, the wood-based industry generates a considerable export share of total country exports (Croatia 10 %, Slovenia 4 % and Romania 10 %). The wood industry in Croatia employs around 10,000 people in 3,500 companies, in Slovenia around 10,000 people in 1,100 companies and in Romania even 120,000 people in over 7,000 companies. Therefore, forestry and wood industries in the Eastern Hub build a good foundation for increasing sustainable wood mobilisation and development of local bio economies.

Forests are nationally considered as an important natural resource and related ministries are the main actors of ensuring the sustainability of forest management and the preservation of biological diversity of all three countries. Based on the ownership structure, structures of decision-making differ within the Eastern Hub. Influence of private forest owners and non-governmental associations is significantly stronger in Slovenia than in Croatia or Romania, where national companies are both, policy/ decision makers and forest managers. Nevertheless, forest management is increasingly influenced by private forest owners, forestry faculties, forestry institutes, as well as forest associations. All countries have a very long tradition of forestry management supported by the related regulations governing the sustainability of forest management, which have been a subject of the improvement in recent years.

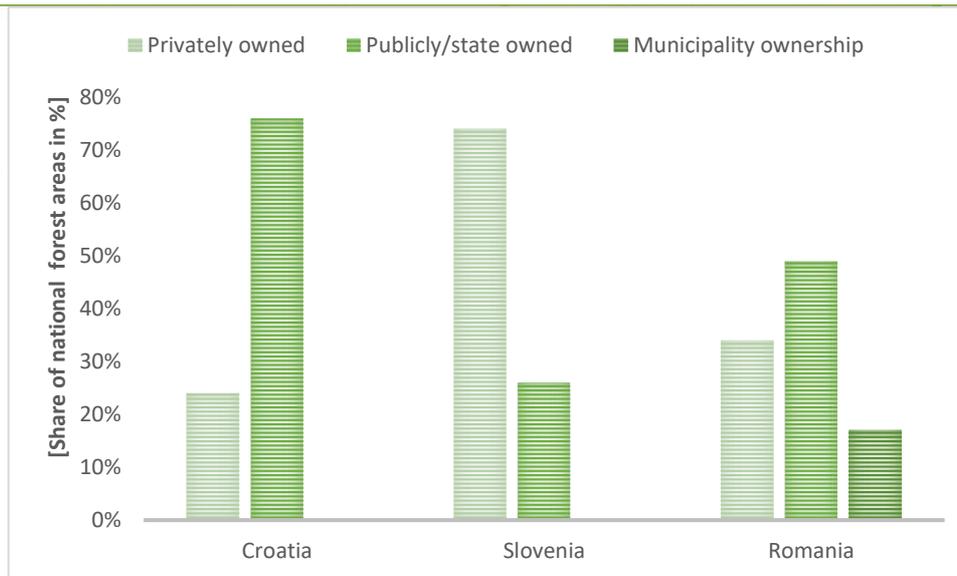


Figure 2: Forest ownership structure in East Europe Hub countries.

Considering all joint and diverse characteristics and issues identified in East Europe Hub countries, a sustainable wood mobilisation presents an opportunity for East Europe Hub to develop a sustainable bio-based economy. To address this target, the interregional Roadmap shall contribute to increasing the sustainable wood mobilisation in the Eastern Hub by identifying best practices and innovations from other Hubs. Through this knowledge transfer, the wood mobilisation in the region shall be improved by implementing best practices from other regions with benefits for all stakeholders in the forestry sector.

1.1.2 MAIN FINDINGS

1.1.2.1 SWOT ANALYSIS

The Eastern Hub partners have developed a SWOT-analysis on the country level, which has then jointly been merged into a regional SWOT. The identified strengths, weaknesses, opportunities and threats were presented to an expert panel for validation. Based on the findings of this workshop, best practices were identified to strengthen the region by addressing the findings of the SWOT. The main findings are shown in **Figure 3**. While the assessment of forest management, harvesting and logistics, markets, financing, education & training, and environment were assessed very similar between the regions, there were two significant differences. The construction and maintenance of forest roads within the infrastructure analysis has been identified as underdeveloped in Romania, while it has been assessed as sufficiently developed for Croatia and Slovenia. Private owners enjoy more support in Slovenia due to their larger share in overall ownership structure, while in Romania and Croatia private owners have a smaller share in the ownership structure and a therefore weaker influence on creation of the forestry policies.

Accordingly, identified strengths of the Eastern Hub region are a long tradition of sustainable and close-to nature forest management and wood production. Furthermore, high quality raw wood material represents a high production potential for meeting the demand for high-quality products. At the same time, challenges arise from fragmented forest properties and lack of private forest owner's management knowledge.



Strengths	Weaknesses
<ul style="list-style-type: none"> • Long tradition in wood production; • Long tradition of sustainable and close-to nature forest management; • High quality raw wood material presents high production capacity; • Forest owners' associations; • Existence of the framework of forest supporting organisations; • Long tradition of high school level and vocational level well embedded in wood processing and forestry education program; • Initiatives to fight climate change • Demand for high-quality products; 	<ul style="list-style-type: none"> • Fragmented forest property; • Low competitiveness of the wood processing industry; • Small number of business support centres dedicated to the SMEs in the wood sector; • Low participation of SMEs in national and international business cooperation structures; • Low level of RDI, technology transfer and cooperation between research and companies; • Lack of favourable national policies and lack of incentive schemes and subsidies; • Lack of professional knowledge of private forest owners in forest management; • Small companies usually have a low productivity: modern technology and equipment are used in a limited extent, and access to finance for these firms is also limited;
Opportunities	Threats
<ul style="list-style-type: none"> • Development of Local forestry value-chains; • Development of regional business models for creation of value-chain; • Strengthening of forest owners' associations and cooperation activities with foresters; • Improved cooperation between industry and R&D; • Development of silvicultural policies towards creating local value-chains for smart and sustainable use of forest resources; • Development and modernisation of technology / mechanisation; • Implementation of modern techniques / practices and knowledge transfer; • Development of alternative sources of wood; • Social networks and digital facility for information sharing (study circles); • High demand for sustainably sourced eco products at developed global markets; • Raising awareness of local use of local resources / products; 	<ul style="list-style-type: none"> • Low level of exploitation of forests / Increase of non-farm forest owners; • Insufficient cooperation between forest stakeholders; • Extensive silvicultural planning insufficiently applied; • Climate change may affect availability of economically most important wood (e.g. oak, beech, fir); • Insufficient interest for investments in development and modernisation of technology; • Low level of awareness of stakeholders on climate change and the necessity to implement adaptation strategies; • Lack of interest of forestry professionals and private forest owners to participate in education / trainings; • International competition with producers from low labour costs countries; • Lack of readiness for cross-sectoral cooperation; • Lack of understanding of ecosystem; • Low level of curriculum improvement

Figure 3: East Europe SWOT analysis – main findings



This situation results in low productivity and low competitiveness of SMEs due to lack of modern technology and equipment use, which represents one of the main challenges for the Eastern Hub. The region's analysis detected a low level of wood sector support along with a low level of participation in business cooperation structures and research, development and innovation (RDI) limiting the options for technology transfer and cooperation. Opportunities were identified in the development of regional business models for creation of local forestry value-chains along with the development of silvicultural policies supporting local value-chains for smart and sustainable use of forest resource. More potential and knowledge could be generated by strengthening of forest owner associations and cooperation activities. They might be further empowered by improved cooperation between industry and research and development (R&D). Moreover, development and modernisation of the technology and use of modern technologies and practices will improve the knowledge transfer. Social networks, digital facilities and platforms for information sharing or study circles offer additional potentials for the development of the forestry sector.

Finally, threats are seen in the low level of exploitation of forests and increase of non-farm forest owners. The insufficient cooperation between forest stakeholders, but also lacking cross-sectoral cooperation will not enable the region to face the international competition with producers from low labour costs countries. Moreover, it is anticipated that a lack of ecosystem understanding will additionally burden the sector.

1.1.2.2 BEST PRACTICES AND INNOVATIONS IDENTIFICATION

The Eastern Hub project partners screened best practices and innovations from their countries in order to identify potentials for improving regional wood mobilisation. An inventory of already existing regional best practices in sustainable wood mobilisation resulted in three groups of best practices, which are shown in **Figure 4**.

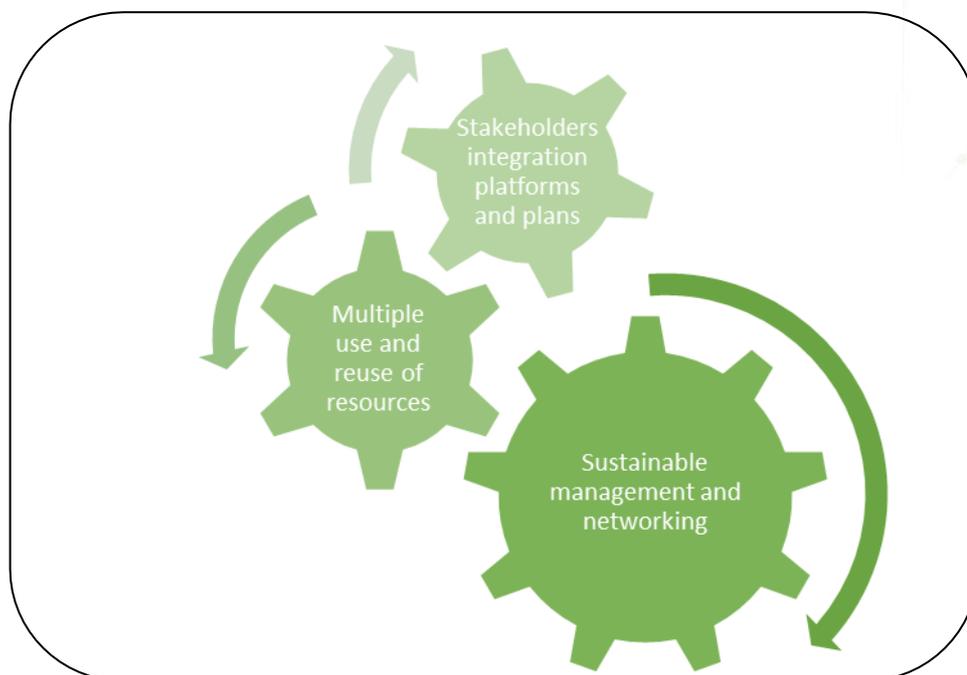


Figure 4: Thematic groups of Eastern Hub best practices and innovations

These three groups represent key themes the gathered best practices and innovations from the Eastern Hub region deal with. Despite the availability of best practices and innovations in these fields, they were identified as weaknesses of the region. Thus, these best practice and innovation examples represent projects which are already contributing to improvements in forestry and the wood industry of the three countries.



The best practices and innovations **WCM – WoodChainManager**, **Machinery hire syndicate Bled** and the forest owner cooperation **Pohorje-Kozjak** are examples of sustainable management and planning, logistics and cooperation/ networking related to mechanization in forest industry. These three examples are implemented in practice and proved successful (continuously increasing number of members, improved business operations and efficiency) in comparison to other systems and approaches.

Cascading use of Wood, **ReWin**, **Wood as primary construction material**, **Collection and use of urban wood waste**, **Open Houses Slovenia** and **Wood Recycling** are examples of good practices and innovations in cascading use of wood resources. The examples reveal successful approaches in using wood for construction material, followed by functioning waste collection, treatment and disposal activities, materials recovery and recycling. These are examples of the fully utilized wooden raw material during the production process, meaning: every processing step leads to one final product. On the other hand, these are examples of re-using substances at the end of the product life cycle through an optimal recycling. Essential features characterising this group of best practice and innovation examples are the implementers coming from the business sector, e.g. enterprises which represent the leaders in applying new sources of materials for production of added value products. This group of best practice and innovation examples tackles the low competitiveness of the wood processing industry in the Hub.

Best practices and innovations **MojGozdar (MyForester)**, **Wood is beautiful**, **Timber auction**, **Timflow** and **ID:WOOD** are related to the i) linking and networking between all stakeholders in the forest-wood value-chain through platforms, ii) action plans for increasing the competitiveness of the forest-wood chain, iii) traceability systems, iv) sharing and transferring technical and organizational know-how to enable local support organizations to address structural deficits of SMEs and enhance innovation potentials. The majority of the mentioned best practices and innovations are implemented in Slovenia and comprehend the inclusion of stakeholders and policy makers participating in networking activities, strengthening managerial/ organisational and technical capacities. Further, policy makers receive guidelines and support to foster development of the sector. All mentioned best practices strongly emphasise cooperation activities between forestry and wood sector stakeholders.

An expert panel prioritisation was done according to the best practices' and innovations' impact on weaknesses in forest-based value-chain regarding the wood mobilisation in the region. The best practice **Wood is beautiful** has been given highest priority, as it tackles the widest range of weaknesses compared to other best practices and innovations. It represents an operational document for increasing the competitiveness of the entire forest-wood value-chain. This action plan sets out the objectives, measures, indicators and deadlines for intensifying forest management and for the revitalization and development of wood processing and the energy use of its residues.

1.1.2.3 NEEDS ANALYSIS

Eastern Hub project partners analysed forestry and wood industry stakeholders' needs based on existing literature studies. In order to tackle additional issues and depending on the availability of extensive studies, the analysis was complemented by questionnaire-based interviews with three groups of wood mobilisation stakeholders: a) forest owners, b) foresters/ contractors and c) wood industry representatives. Croatian and Romanian partners analysed stakeholders' needs primarily based on literature analyses, while Slovenian partners analysed stakeholders' needs primarily on results of implemented questionnaire-based interviews. Based on the results, measures for improvements are defined.

Croatia

Forests are mainly (76%) owned by state, while 581,770 hectares (24%) are owned by almost 500,000 private owners which indicates the size of private forestry properties. Most new forest owners are interested and willing



to cooperate, manage forests and produce different forest products for the specific markets. Nevertheless, the use of modern tools and technology is still inadequate as well as knowledge about how to deal with nature caused threats. Hence, stronger as well as practical support on the field from advisory services and forest associations is needed. Forest owners exploit their forest for own needs and a small share is used for selling on the local or national market via public tenders or private owners initiatives. The main need is the lack of capacities which could be overcome by stronger and more result-oriented advisory support and a more focused support from associations for joint production and marketing approaches. These approaches should be tailored for specific niche markets related to new innovative products from private forests.

Concerning the forestry contractors, development started with opening the Croatian forests Ltd. to private contractors and with the establishment of the Croatian Chamber of Forestry and Wood Technology Engineers. Licenced forestry contractors are involved in silvicultural works, forest reproduction material and harvesting operations mainly for state owned company. Smaller number of contractors are involved in construction and maintenance of forest infrastructure, development of forest management and hunting plans. Contractors expressed needs for more botanical knowledge, cultivation skills, implementation of digital tools and administrative/ management skills as priority education areas. Further, they expressed the need for expert advisory support in addressing environmental challenges due to insufficient knowledge on these issues. A smaller number of contractors are members of associations already but would expect greater state and association support through expert advisory services, financing programs and forest management. The main needs of the forestry contractors are related to knowledge and capacity building, cooperation and support in environment and business changes.

Wood industry stakeholders are not satisfied with the raw wood material distribution model and expect greater support from associations and national/ local authorities. Additionally, expert support is also requested through financing programs. Circular economy for smart, sustainable and inclusive growth is continuously promoted in the area of Vukovar-Srijem County by local Wood Cluster Slavonian Oak and Competence Centre Ltd. for research and development as well as efficient use, recycling and reuse of resources also. Optimized cascading use of wood is introduced as new and multidisciplinary management approach, which considers use of wood side-stream products and higher recycling level of wood products. Yet, this is not fully recognised in the Croatian wood industry. A main business management challenge is insufficient knowledge and advisory support, since wood industry stakeholders are mainly small crafts and SMEs, with only few larger companies. Even though the wood industry is satisfied with the recruitment of the workforce, they identified the wood processing skills, innovation and technology transfer, scientific knowledge about the wood as material, implementation of digital tools and machinery as priority education areas needed for enhancing the workforce quality and overall business development. Main problems and needs are comprising accessibility of quality wood as raw material, problems and lack of financial support for technology development or innovation implementation, and improvement of production processes efficiency (cascading use of wood, use of residual wood for energy production etc.).

Slovenia

In Slovenia, 76% of forests are privately owned. Fragmented forest property, small size of average forest property (2.9 ha) and high number of private forest owners (PFOs) hamper professional work and optimal use of wood in private forests. Establishment of PFOs associations and machinery rings are important steps towards strengthening of private forests management. However, the willingness for cooperation of PFOs is still insufficient, greatly influenced by forest property size, age and co-ownership. PFOs manage their forest mostly by themselves with help of family and contractors. The wood harvested from private forests is used for household consumption (construction, heating) or sold mainly to the local consumers. The main identified issue PFOs are facing is low timber price, while on the other hand wood industry stakeholders consider prices of wood too high and not in line with its quality. The current situation on wood market does not satisfy the needs of



domestic wood industry for year-round and reliable wood supply in terms of quality and quantity. Therefore, more knowledge about prices and timber market organization along with organisation of joint wood sale from private forest is needed.

Natural hazards in recent years made all stakeholders of forest-based value-chain more aware of climate change and its (negative) effects on the forests in general and the wood's quality and quantity in particular. Working in forests after natural hazards is more demanding, dangerous and less cost-effective. Therefore, PFOs and forest contractors would like to receive more support in addressing environmental challenges in terms of subsidies, seedling material and extended services.

Side streams of wood (wood dust, branches) produced during harvesting in private forests and wood processing are mainly used for heating purposes, but also sold to biomass heating plants, paper industry and farmers. In case of PFOs and forest contractors, other use of wood, in terms of cascading use of wood, was not taken into consideration so far and represents an option for improvement. So far, a large amount of side streams and waste wood is lost in Slovenia and its recycling/ reuse will need to get more attention.

The main challenges of the Slovenian wood processing industry are a non-optimal business environment, lack of innovative and high-tech materials and products, lack of products with added value, outdated design of products, lack of cooperation with R&D institutions, issues with environmental standards, distributed, fragmented and insufficient interconnection of supply chain, lack of trust in wood as a construction material, lack of well skilled and trustful personnel, obsolete tools and technology. Regardless the identified challenges, the business of the wood-processing industry has a positive trend in terms of number of employees, revenues from sales and in the share of exports. In Slovenia, there are several networks, associations and mechanisms that offer support in the field of wood industry. Support of decision makers in terms of grants is of high importance and already shows good results.

Romania

Regional and national policies related to the forest-based industry in Romania are often changing, unclear, or do not support development of the industry and the business. Consequently, cooperation between the different actors of the industry is lacking. Cross-sectorial cooperation is very low, and its importance is not recognised. The available experts and human resources in the forest-based industry face an enormous need for skilled workers and experts, due to poor quality of the vocational training and low salaries causing experts to emigrate. Development of new legislations and regulations is needed to create the vocational school system in line with the expectations and needs of the companies. Related to funding, there are some EU-funded and local funding programs, which are complicated to access. The Government does not recognise the importance on creating specific/ sector funding schemes. Research and development (R&D) actors, universities and research institutions are looking for methods and partnerships to approach SMEs to cooperate and create innovative products.

With regard to the important role in the economy and to acknowledge the long tradition of wood processing in Romania, it is necessary to boost the sector by raising the awareness of entrepreneurs and all other significant stakeholders of the region. Therefore, a joint strategy is needed to design the regional profile of the wood industry sector and its sub-sectors. It is important to emphasize the relevance of innovation in establishing the new directions of development.

Despite the emphasis on the social and environmental sustainability of forests in Romania, there are serious obstacles to achieve such goals. Based on several studies, post-socialist political and economic reform has provided opportunities for a wide range of actors to benefit from premature practices that negate any serious attempts to manage forests in a sustainable way to meet the social, economic, ecological and cultural needs of present and future generations. Few years ago, the restitution of state forestland to former owners led to



uncontrollable harvesting and timber theft in the early years of transition. According to the stakeholders, the exploitation of Romania's forests is supported by a political elite in use of the public timber resource for own and parties' benefit. At the same time, the high market demand for timber supports the exploitation process and big international companies are paying higher prices for the harvested raw material. A centralized system of regulation imposes a blanket approach to forest management, in both the public and private sector. Despite the aim of enforcing sustainable practices, it is widely seen as oppressive, ineffective and not accountable at the local level. Rural communities rely on fuelwood for domestic use but face limited and unequal access to this important energy source. According to the stakeholders, decentralization is considered as an essential tool that can destabilize corrupt power bases, while there is currently little political support for further administrative decentralization. Private owners currently have limited management options. A legal framework thriving for greater accountability and transparency in forest governance is needed, as well as extended and more widespread cooperation between government departments and more collaborative forms of management involving local communities.

Changes in the forestry code in 2017 negatively influenced the quantities of round wood on the market, especially of low-quality assortment. This led to the excessive prices and significant logwood volume import. The long-term forest management plans foresee the increased volume of round wood available. Standing timber, which is not harvested, indicates that the situation is not in accordance with the plans. Reduced log volumes and unsustainable prices in the last two years led to reduced purchases of the wood panel industry in Romania. Some of the smaller factories discontinued their production, while others rely massively on imports of logs. The Romanian foresters responded to the resource crisis and exaggerated prices with increasing imports and reducing its purchasing activity in Romania. The main need of the Romanian wood industry is that the Romanian Forest Code, and the Romanian Forest Agency Romsilva, that manages state owned forests, modifies round wood selling rules to increase the volume of round wood on the market. According to the wood industry stakeholders, Romsilva could potentially put on the market the volumes not harvested in the past 2 years.

The Eastern Europe Stakeholder needs analysis identified problems related mostly to insufficient availability of the raw wood material, lack of cooperation between stakeholders across and along the forest-wood value-chain, insufficient knowledge and skills of human resources. Further, insufficient use of modern tools and technologies is a main obstacle for the development of forestry and wood industry sectors.

1.1.3 DEVELOPMENT TARGETS FOR SUSTAINABLE WOOD MOBILISATION

Based on the SWOT and needs analysis of the Eastern Hub, the overarching target of more sustainable wood mobilisation could be achieved through an improved use of local wood. Based on relying on local wood, improved local value-chains could be established from the tree in the forest all the way to the final products with high added value. The local wood for local use is a precondition for a strong local forestry value-chain which ensures a strong local bio-based economy, contributing to a strong regional, national and European economy. It is recognised by the local stakeholders and local governments, but in some countries not by the national level institutions and ministries, which are the main actors and decision makers in forestry and wood sector.

Furthermore, analysis results imposed the following development targets:

- **Improved cooperation between forest owners/ stakeholders and stronger national (political/ financial/ policy) support for forest associations.** Development of silvicultural policies towards creating local value-chains for smart and sustainable use of forest resources, along with digitalisation and modernisation of the forestry and wood industry mechanisation, will ensure an improved sustainable wood mobilisation. Moreover, a sustainable use of raw wood material as a base for industry development should be supported by cooperation/ networking of forestry stakeholders and R&D



institutions. The mentioned development targets are recognised by all levels of governments and stakeholders, but due to lack of funding resources, they remain targets.

- **Harvesting and logistics** shall be improved by means of digitalisation and modernisation of mechanisation. Social networks and knowledge transfer shall enhance forestry stakeholders' skills. Alternative sources of wood are seen as a potential wood mobilisation measure by expert stakeholders, while this is not recognised by the governments and ministries. Therefore, actual supporting programmes are still missing.
- **Awareness should be raised** for using local resources/ products, cascading use of wood and improvement of wood usage efficiency. Promotion of wood as environmentally friendly material and stronger promotion of local products through joint marketing activities will help smaller wood processing SMEs to achieve higher market shares. Mechanisms to ensure adequate wood supply in line with demands of domestic (national) wood industry should be developed. Hence, enhancement of the stakeholders' cooperation for a joint appearance on international markets would contribute to an improved performance of the wood processing industry of the entire region. This development target is not fully accepted by the stakeholders. Being a rather new and modern approach, it is mainly promoted through projects and expert institutions' activities. To enable local and national governments for creation of necessary preconditions, more efforts are required.
- **Improved legal framework to prevent ownership fragmentation**, i.e. development of the affirmative/enabling legal framework. National governments are the main actors for improving legal frameworks of the last years, which are characterised as insufficient by the experts and practitioners. Additional efforts are needed to develop a legal base for the sector development.
- **Wood and forestry supporting financing programs** require stakeholders to contribute to improvement of the wood and forestry sectors. This development target must be introduced by the national governments, which have to develop subsidy programs in cooperation with financial institutions, supporting mentioned financial programs.
- **Up-levelling of educational programmes** by introducing modern technologies and cooperation between education institutions and economy sector. Again, national level government and related ministries are the main actors for development and implementation of the modern curriculum in line with the stakeholder needs.
- **Environmental development targets** require an improved collaboration on national and international level concerning conservation, biodiversity and sustainability. This is highly emphasized along with the development of climate change adaptation strategy and action plans. Even though national and local governments are promoting these targets already, stronger efforts must be invested to reach and educate local level stakeholders, especially in rural areas.

The East Europe Hub development targets represent a wide range of aims for wood mobilisation based on the local use of local wood. This incorporates the potential to empower the local forestry and wood-processing sector as well as the European (bio-) economy. Even though most of the listed development targets are fully recognised by all forestry and wood stakeholders, including the decision-making bodies (through national strategies¹ for development of forestry and wood industry), stronger policy level support is needed through simplified funding.

¹ Development Strategy for wood processing and furniture production of the Republic of Croatia 2017 – 2020; Action plan to increase competitiveness of the forest wood chain in Slovenia by the year 2020; Forest Development Programme of Slovenia 2030; Romania National Forest Strategy 2014 – 2023; National sustainable development strategy Romania 2013 – 2020 – 2030



1.1.4 PRESENTATION OF THE INTERREGIONAL ROADMAP

The ROSEWOOD project focuses on the transfer of know-how and experience throughout Europe. Through the network's activities, all actors across and along the forest-based value-chain and regional authorities should be enabled to learn about existing best practices and innovations. This roadmap for the Eastern Hub presents successful innovations and best practices from other regions that have the potential to strengthen the region.

Within the forest management section, small and fragmented private forest properties and the lack of private forest owners' management knowledge are identified as weaknesses which could be addressed by implementing practices related to the optimization of forest management, silvicultural planning and different working processes as well as the improvement of forest management through development and use of communication and consulting assistance. Mentioned issues could be addressed by establishing training and education centres for improvement of knowledge and skills of private and corporate forests and stakeholders. Further, the knowledge of forest stakeholders could be improved by exchanging data through an operational collaborative platform for all stakeholders in the forestry and wood sector. Professional organisations and national advisory services are actors which could steer and drive these changes.

Therefore, the East Europe Hub project partners used the ROSEWOOD network to identify best practices and innovations from the Central, Northern and Southern Hubs according to their impact on the weaknesses and identified in the SWOT analysis. The selection was presented to experts in an expert panel workshop for validation and steering of a strategy. A prioritisation of possible solutions to improve the current situation were identified by screening the list of best practices and innovations and matching them with weaknesses, opportunities and threats of the Eastern Hub. According to the matches, best practices and innovations have been prioritised by the expert panel participants. Higher priority level is reached with the higher number of weaknesses which practice or innovation matches.

Since numerous weaknesses have been identified within the Eastern Hub SWOT, project partners defined seven priority best practices (marked in bold) and innovations according to the wide range of weaknesses they tackle, as a recommendation for the implementation. East Europe Hub Expert Panel participants² from forestry faculties, institutes, wood clusters and non-governmental associations validated the selection of 21 best practices and innovations as recommendation to be implemented in East Europe region (**Table 1**).

Table 1: List of prioritised best practices and innovations from other Hubs

No.	BP/ Inno No.	Best practice/innovation	Subject of the BP/innovation and expected results
1	BP4	PASSFOR (Plan for Socioeconomic Activation of the Forest Sector)	The forest sector promotes socioeconomic activity (contributes to the diversification of economic activity at rural areas; increases the number of employments related to forest activity, improves the incomes of the working people in the forest sector; increases the size of the forest property and attain economically efficient surfaces for a sustainable forest management).

² Participants of the expert panel: Danijel Bertović, Local Development Agency PINS; Biljana Kulišić, Energy Institute Hrvoje Požar; prof.dr.sc. Tibor Pentek, University of Zagreb, Forestry faculty; prof.dr.sc. Stjepan Pervan, University of Zagreb, Forestry faculty; Stella Šatalić, WWF Adria; Ana Dijan, Croatian Wood Cluster; Rosana Šimunović, Croatian Wood Cluster



2	BP1	Rolling silviculture planning (annually)	Optimization of forest management, silvicultural planning and different working processes.
3	BP6	Joint ownership, forest consolidation	Bigger forest estates with easier access to forest property, more cost-efficiency in harvesting, easier management, tax relief.
4	BP3	KomSilva – Joint Project: Development and Use of communication and consulting assistance for private and communal forests for addressing forest owners and to intensify public relations in forestry	Improvement of forest management through development and use of communication and consulting assistance.
5	BP8	MOTI / “Mobile Timber Cruise”	Digitalization of the Forest stand inventory and forest operation planning (determining the most important dendrometer indicators).
6	BP10	«#WOODVETIA – Campaign for more Swiss wood»	Emphasized importance of the local wood mobilisation and the benefits of a sustainable forest management as an important issue to improve the wood mobilisation in long-term a foresting the wood value-chain. Improved demand for local wood products.
7	IN6	Case BioA refinery concept – Fertilizers from side flows of wood-based industry and ashes of wood-based power plants	Implemented concept of new fertilizer production using circular economy methods. Implementation of good example of circular economy and cascade use of wood.
8	IN2	FORETDATA	Improved knowledge of forest stakeholders’ activities by exchanging data through operational collaborative platform for all stakeholders in the forest-wood-paper sector.
9	BP2	ForLog	Improved quality of silviculture and forestry operations applying the set of tools adapted to the needs of very small forestry and logging companies.
10	BP7	Funding guidelines in Bavaria: FORSTZUSR 2015, FORSTWEGR 2016 and WALDFÖPR 2018	Improvement of the forestry through establishment of funding system for projects and related actions of forestry stakeholders within the framework of a forestry funding program.
11	BP13	Heat entrepreneurship	Implemented operational model for production of heat for customers by using renewable solid bio-fuels. Clustering of heat entrepreneurs, heat entrepreneurship units, research, training and the supply of machines and equipment for the whole production chain
12	BP11	“Marteloscopes”	Improved decision-making capacity of forest management and silvicultural interventions based on transparent data.
13	BP12	Bavarian School for Forest Farmers	Establishment of the training and education centre for improvement of knowledge and skills of private and corporate forests and all people interested in the forest.



14	BP14	Improvement of climate protection services of managed forests by collaborative management of small and micro private forests in North Rhine-Westphalia	Development of forests adapted to climate change by a sustainable and strengthened mobilisation of resources. Approaches for collaborative forest management and the necessary frameworks and possibilities for implementation of private forest owner's cooperation.
15	IN4	Neosylvaq (online wood auction)	Use of new technologies to make the wood sales system economical and dynamic, and to fluidize information to increase wood mobilisation and get forest owners involved in management.
16	IN5	Virtual Forest	Improved forest management with applying 3D forest visualization combining actual forest data, GIS and game technology for implementing forestry actions and observing results, and for combining forestry operations.
17	BP5	Joint wood terminals	Improved cooperation between forest service providers through joint wood terminals of forest companies for short-term storage of wood. Decreased environmental effects because of centralized terminals.
18	BP9	KEMERA funding (Funding for Sustainable Forestry)	Establishment of Government's funding / subsidy for certain types of forest management activities.
19	IN1	ECOR	Development of principles for waste stream reduction and diversion with the goal of solving one of the world's most challenging environmental problems - waste disposal and diversion.
20	BP15	WBV Logistics: Optimization of the timber harvest chains and mobilisation in private forests – regions Holzkirchen, Rosenheim and Traunstein	Improvement of the flow of information and of material in the timber supply process of the forestry associations.
21	IN3	ELDAT	Implementation of national standard which enables a consistent communication between all involved partners of the process chain. It enables the transfer of single timber data (formerly the list of wood) as well as the transmission of process defining information.

The identified approaches could tackle some of the weaknesses identified in Eastern Hub SWOT analysis. The **PASSFOR - Plan for Socioeconomic Activation of the Forest Sector** best practice from the Southern Hub has the potential of address several weaknesses of the Eastern Hub. The low competitiveness of the wood processing industry might be enhanced by increasing the productivity of small companies. This could be achieved by increasing the use of modern technology and equipment as well as increasing the access to finance. Implementing the best practice **Rolling silviculture planning** (annually) from the Central Hub could tackle the lack of professional knowledge of private forest owners in forest management. Furthermore, **KomSilva – Joint Project: Development and Use of communication and consulting assistance for private and communal forests** may increase professional knowledge as well, complemented by increasing the small number of business support centres dedicated to SMEs in the wood sector. The best practice **MOTI Mobile Timber Cruise** could address a low productivity small companies - modern technology and equipment are used in a limited extent, and limited access to finance weaknesses. The **WOODVETIA – Campaign for more Swiss wood** could address the low competitiveness of the wood processing industry and necessity of local forest-based value-chains development.



The best practice **Joint ownership, forest consolidation** from the Northern Hub may bring fragmented forest properties into a joint undertaking, building on the professional knowledge of PFOs and engage SMEs in national and international business cooperation structures. **Case BioA refinery concept – Fertilizers from side flows of wood-based industry and ashes of wood-based power plants** may reinforce local forest-based value-chain developments by fostering the low competitiveness of the wood processing industry and the low level of RDI, technology transfer and cooperation between research and companies.

The above mentioned best practices provide the potential to strengthen local forestry and wood industry value-chains. Implementation of best practices with adjustments to individual legislations and frameworks would be recommended to stakeholders of forestry and wood industry value-chains. This needs to be defined depending on exact best practice examples and funding possibilities.

1.1.5 IMPLEMENTATION OF THE ROADMAP

The analysis of the East Europe Hub wood and forestry sector, shown in the previous sections, indicated the need for sector improvements. The sustainable use of resources needs to be accomplished based on the improvements of human resource skills and knowledge that are accompanied by intensified activities related to networking and collaboration of the stakeholders. The interregional roadmap shall support the Eastern Hub in achieving its overarching objective of a sustainable wood mobilisation. It contributes to realising a sustainable forestry and wood resource management, relying on protection and preservation of biodiversity.

Due to the analysis results of East Europe stakeholders' needs, the implementation of such a roadmap presents a long-term time scale activity including implementation of existing best practices and innovations. The decision-making capacities of the East Europe Hub, forest management and the silvicultural interventions shall be based on transparent data. The quality of the data could be improved by applying 3D forest visualization, combining actual forest data, GIS and game technology for implementing forestry actions and observing results, and for combining forestry operations.

Furthermore, within the forest management, stakeholders identified the lack of tailored support to small scale forest owners and associations and centralised distribution of raw wood material by the state forest owner as weaknesses that could be addressed by development and use of communication and consulting assistance. The implementation of approaches for collaborative forest management through frameworks and platforms might enhance stakeholders' cooperation. Benefits of joint ownerships, which have proven successful in other regions, may result in easier, more cost-efficient management and tax relief. Further, joint approaches might provide access to technology modernisation throughout the forestry and wood industry value-chain. New technologies could be used for the wood sales system. This way, new technologies offer potentials for strengthening economic development and dynamic sales systems. New communication and information channels might increase wood mobilisation, as they facilitate the process of involving forest owners in forest management.

The socioeconomic activation of the forest sector is a promising approach of targeting the fragmented forest properties and low productivity and non-competitive SMEs. This kind of activation plans would promote socioeconomic activities, leading to a diversification of economic activities in rural areas. As a consequence, more jobs may be created in the forestry sector securing the incomes from forestry. Scale-effects could be used if forest property sizes increase, as well as by attainment of economically efficient surfaces for a sustainable forest management. Funding systems for projects and actions related to forestry stakeholders are required for establishing new frameworks and foster value-added final products. Concepts such as new fertilizers from circular economy approaches or cascading use of wood might incentivize recycling, which was identified as a weakness of the Eastern Hub as well. Furthermore, the introduction of an operational model for production of heat for customers by using renewable solid bio-fuels, clustering of heat entrepreneurs, heat entrepreneurship units, research, training and the supply of machines and equipment for the whole production chain could

contribute to transform weaknesses into strengths. Development of principles for waste stream reduction and diversion with the goal of solving one of the world's most challenging environmental problems - waste management - could impact on the improvement of the industry.

Since above mentioned issues are identified along and across the forestry as well as the wood industry sector of the Eastern Hub countries, recommended practices are applicable for all levels of the forestry and wood industry including their stakeholders of the value-chain. Therefore, the recommendations of the Roadmap are directed toward stakeholders as ministries, local governments (counties and municipalities), education and research institutions, forest and wood industry, wood clusters and private forest owners' associations. East Europe hub partners actively participate in events related to forestry and wood sectors attended by diverse auditorium representing mentioned stakeholders. Such opportunities are used for presentation and promotion of the Roadmap as a base for further sector development.

The greatest benefit of the ROSEWOOD interregional roadmap arises from the presentation of concrete, already proven and successful solutions to meet some of the needs and weaknesses of the East Europe Hub. Knowing the local conditions, partners will have to invest significant efforts in promoting the benefits of the Roadmap and support the initiation of collaboration among the stakeholders. By implementing best practices and innovations from other regions (South, North and Central Hub) and adapting them to the regional context, great potential for overall improvement and development of the East Europe forestry and wood industry sectors would be created. Additionally, the interregional character of the roadmap gives a holistic picture of the region as a whole, with respect to all specificities of individual countries.

1.1.6 CONCLUSION AND OUTLOOK

The ROSEWOOD project aims at building an EU-network of regions to enable stakeholders of the wood mobilisation value-chain to connect and share best practices in the field, cooperating cross-sector and multi-disciplinary along and across the value-chain. The ROSEWOOD network is a platform used for identification of potential examples of improvements and networking between the Hub partner countries as well as partnering countries. The interregional roadmap builds on the validated SWOT analysis and puts the identified main challenges of the Eastern Hub region into a strategic plan. Therefore, the interregional roadmap presents recommendations for tackling the weaknesses and threats of the region with knowledge and practical experience from other regions in the form of best practices and innovations implemented in other Hubs as good examples. This interregional roadmap contains descriptions of the recommended best practices and innovations as well as the expected results. The above-described activities will be followed by further project activities to enable and strengthen sustainable wood mobilisation with the target of improving the Eastern Hub region. To further steer the exchange and transfer of best practices, the ROSEWOOD [Map Viewer](#) showing the best practices and innovations is publicly available. This way, the ROSEWOOD network serves as a platform for initiation of collaboration between regional stakeholders with other Hubs' stakeholders which are implementing recommended practices. This joint approach could be used on regional inter-Hub level for a long-term exchange of knowledge and technology in the wood mobilisation sector - to enhance and promote use of local wood and to establish and strengthen local value-chains from the tree in the forest all the way to the final product with high added value.

